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THE ECONOMICS OF MANPOWER POLICY IN
THE ONTARIO CONTEXT
by
D.A. Dawson, F.T. Denton, and
B.G. Spencer

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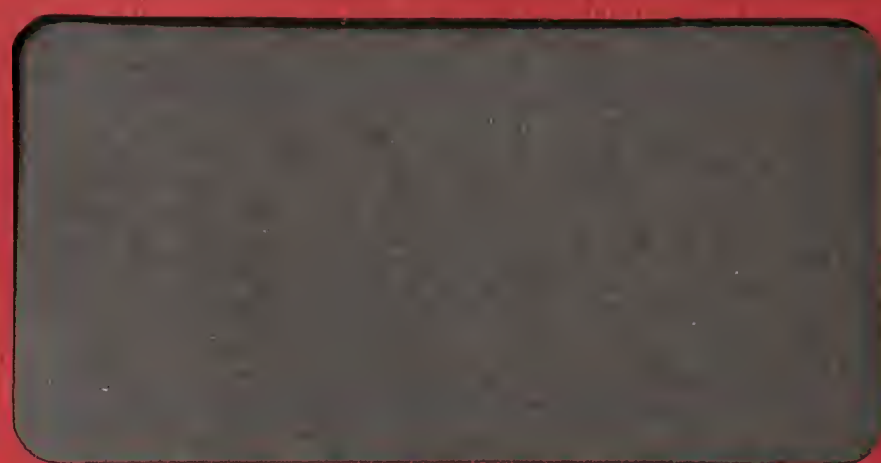
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P R E F A C E

This study was carried out under contract between McMaster University and the Ontario Economic Council. Many people in the employ of the Governments of Ontario and Canada assisted us by providing statistical data and other information about particular government programs. Research assistance was provided by Christine Feaver and Nancy Mann at various stages of the study and secretarial assistance was provided by Gail Kalika. Our colleague Leslie Robb gave us the benefits of his comments on some of the material in earlier draft form. There were helpful discussions at an early stage with Lorie Tarshis, who was Director of Research for the Ontario Economic Council when the study commenced, and with Tassos Bellessiotis, who was the Council's research officer most directly concerned with the study at that time. A number of useful comments were provided by participants in a seminar organized by the Council and held in the spring of 1980 and subsequently by anonymous referees appointed by the Council to read the first complete draft of the final report. We thank all of these people for their help. The first draft was completed in September 1981 and the present revised version in July 1982.

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CHAPTER 1

INTRODUCTION

This study is concerned principally with the longer-run aspects
of manpower policy. As usually defined, such policy has both short- and
long-run goals and consequences. In the short run, it may be directed
towards reducing the level of unemployment and the provision of jobs,
either for the labour force as a whole or for particular groups, such as
young people, older workers, or the handicapped. In the long run, it may
affect both the size and quality of the labour force. Immigration,
to take an important example, has a bearing on the future size, age
structure, and skill composition of the working population. Similarly,
training or retraining programs affect the future level and distribution
of skills in the labour force, and hence the level of labour productivity
throughout the economy. Roughly speaking, these longer-run effects may
be thought of as stock effects: they alter the size or productivity of
the stock of labour, and consequently persist over long periods of time.
The short-run effects may be thought of as more transient in nature:
they relate to current flows of labour between employment and unemployment
and may leave little or no trace in the long run.

The decision to concentrate on the longer-run or stock effects
of manpower policy seemed to us a reasonable one at the outset of the
project, and in retrospect it still seems reasonable. It is questionable
whether the short-run aspects of manpower policy can be studied meaning-
fully in isolation from government economic policy generally. For example,
the financing of a job-creation program has implications for the government

budget, and hence for the economy at large. New jobs may be created, but one has to ask whether they are offset somewhere else in the economic system by reductions of jobs because of tax increases or because of decreases in other categories of public expenditure. The common practice of simply reporting the number of new jobs created under some program or other may be misleading, inasmuch as the direct or gross effect on employment may be quite different from the net effect, once the repercussions throughout the government financial accounts and the general macroeconomic system have been fully recognized. Moreover, general tax or expenditure policies, or policies of a specific nature but ones not bearing directly on the labour market, may in fact have greater employment effects than manpower policies per se. If one is concerned with objectives, the line between manpower policy and general stabilization policy is not an easy one to draw. A study of the first in isolation from the second would seem to be rather unrealistic.

The foregoing is not intended to suggest that a line can be drawn with precision between long-run and short-run aspects of manpower policy. Obviously, this is not the case. Nevertheless, at a conceptual level the distinction seems to us to be a helpful one in classifying the goals and instruments of manpower policy for purposes of analysis. We have been guided by it in choosing a focus for the present study.

The line between "education" and "training" is not easy to draw either. Literacy and elementary mathematical skills are basic to an industrialized society, but not normally regarded as matters of concern under the heading of manpower policy. Further up the ladder of educational skills,

though, the distinction becomes increasingly blurred. To the extent that training involves preparation for a job, all courses of study could be classified (not very helpfully) as training. For example, one person in a class in English literature may derive only cultural benefit but another may be preparing for a career as a teacher. There is no way around this difficulty and any attempt to study manpower policy must recognize that the term can have no precise definition. Nevertheless, governments have come to associate certain areas of influence with the term, and it is these that are of concern in this study.

One other general observation is in order. The topic of manpower policy is very broad, and it remains broad even when attention is confined to long-run effects. The practical aspects of particular programs are apt to be complex and deserving of careful study, planning, and ongoing review. We make no pretense of studying the complexities and detailed characteristics of individual programs that may be operative now in Ontario, or that may be under consideration. Our aim, rather, is to provide a general framework for considering such programs -- and the policies which they reflect -- from the point of view of their collective impact, and to offer an analysis which may help in understanding broad implications of manpower programs in the overall context of economic growth.

The organization of the study is as follows. We begin, in Chapter 2, with a review of the history and objectives of manpower programs in Canada and Ontario. Training and immigration policies are considered. Evidence is provided relating to policy objectives by citing statements from parliamentary debates and other sources. Both federal and

provincial programs are considered, and the issue of federal-provincial jurisdiction in matters of manpower policy is addressed. The overall aim of this chapter is to provide a general context for the particular analyses and descriptions which follow.

Chapter 3 provides an "inventory" of manpower programs operative in Ontario, including both federal and provincial programs. Statistical data and other information are assembled and discussed. The aim is to provide as comprehensive a picture as possible of the overall size and nature of such programs. Included in this chapter is a brief comparison of Canada with other countries, drawing on data assembled by the Organization for Economic Cooperation and Development.

Microeconomic considerations are introduced in Chapters 4 and 5. In Chapter 4, the costs and benefits of training are looked at from the point of view of an individual firm or employer, drawing on the theory of human capital. The conditions under which a private firm would be motivated to train its employees are examined and some possible forms of government involvement are suggested.

The costs and benefits of training are considered from the point of view of an individual worker in Chapter 5. Some analytical framework is again provided by the theory of human capital and the theory of lifecycle planning is also of relevance here. The present values of lifetime income streams for persons with and without training are compared in this framework, after allowance for costs of training, including income foregone during the training period. The implications of the personal income tax for training incentives are considered in this context. Some possible roles for government in facilitating and providing incentives for training are discussed.

Chapter 6 takes up the question of how manpower training programs and immigration interact with the economy and influence its rate of growth. The aim of the chapter is to develop a theoretical framework at the macrolevel. Effects on productivity, production, income, and the macroeconomy in general are discussed. Training is viewed as a form of investment in human capital, implying a sacrifice of current consumption in the expectation of higher levels in the future. The effects of training are thought of as embodied in the stock of labour available to the economy, and hence carried forward in time, depending on rates of attrition associated with death, retirement, emigration, and possibly the obsolescence of skills. Immigration is considered as a source of manpower growth. To the extent that it is possible to control its skill content, immigration is considered also as an alternative to the training of the existing labour force. A fundamental consideration in developing the framework is the nature of the macroproduction process and the extent to which substitution is possible within the economy among skill categories of labour and between labour and capital. This issue is discussed and alternative representations of the production process are considered.

The theory developed in the previous chapter is drawn upon in Chapter 7 to design a formal theoretical model of the macroeconomic system incorporating manpower training and immigration. The model serves to make more concrete some of the ideas developed previously. It is used in a series of computer simulation experiments which illustrate how an economy responds to training and migration in the long run and how aggregate costs and benefits combine to determine net effects on per capita output and other economic variables of interest. Various assumptions are made

about the nature of the aggregate production function and other character-
istics of the economy and the implications of these assumptions are drawn
out experimentally.

Chapter 8 provides a review of the study and a summary of its
principal findings. The chapter is concerned especially with implications
of the findings for issues of public policy.

CHAPTER 2

<u>MANPOWER PROGRAMS AND THEIR OBJECTIVES: A REVIEW</u>

<u>OF THE RECORD</u>

1. <u>INTRODUCTION</u>

Governments in Canada have been involved in
manpower training since early in this century. Section 2
provides a brief historical overview of such government
involvement, with attention to some of the issues of
federal-provincial jurisdiction. (This review, as well as
some of the subsequent material, owes much to the excellent
study by Dupré, Cameron, McKechnie, and Rotenburg (1973).)
The stated current or recent federal and provincial
objectives of such training are considered, drawing on the
published record of official pronouncements and legislative
debate. The role ascribed by federal and provincial
authorities to immigration as a tool of manpower policy is
considered in section 3. Some concluding remarks are offered
in section 4.

2. <u>GOVERNMENT PARTICIPATION IN TRAINING: AN HISTORICAL</u>

<u>OVERVIEW</u>

Section 93 of the British North-American Act
states:

> "In and for each Province, the
> Legislature may exclusively make
> laws in relation to education."

Provincial legislative authority in the field of education has been guarded jealously since Confederation: it has been "the spearhead of provincial autonomy" (Dupré et al.,p.13). At the same time, the federal government has had the responsibility for the management of the economy. By about the turn of the century the importance of vocational and technical education in the pursuit of the goal of economic development had become evident. Pressure emerged to persuade the federal government to take an active role in assuring a more appropriate supply of trained people. Federal legislation in the manpower field passed in 1912 and 1913 represented the basis for the first major conditional grant of any sort, and also the first federal expenditure of consequence in the area of education.

For more than half a century thereafter, federal funds for education continued, under a variety of particular programs, in the form of conditional grants. But from the end of World War I the grants became not only conditional (on the specified use of the funds by the provinces) but also subject to a matching requirement. That meant that the provincial governments had to provide funds in equal amounts (or in some other agreed proportion) and for the purpose specified. The potential for conflict with the expenditure priorities defined by the provincial governments was great and many provinces chose not to make use of the federal funds for that reason: even at reduced cost for specified

programs, they preferred to make other expenditures instead.
Ontario, which was not only the richest, but also the most
industrialized province, was the one to accept the lion's
share of federal funds available for technical education.

In the early 1940's, with the war effort well under
way, and the memory of the depression still fresh, other
components of a federal manpower policy were put in place,
with the creation of the Unemployment Insurance Commission to
provide financial assistance to those who had become
involuntarily unemployed, and the National Employment Service
to help them find jobs. At about the same time legislation
was passed which continued the practice of matching
conditional grants for technical education, and added similar
grants for training the unemployed. The grants under this
and successor programs were for both operating and capital
expenditures, but the fact that so little of the capital
expenditure portion was used reflected the continuing
discrepancies between the priorities of the "have-not"
provinces and the federal government.

No province had been more obliging than Ontario in
responding to the incentives provided by the federal
government. Indeed, by virtue of having the major industrial
base in the country, and also of being the richest province,
Ontario found that the federal largess in providing funds in
support of both technical and academic education fitted
easily within its own established priorities. In fact,
manpower policies and programs had grown up in Ontario at

much the same time as they had at the federal level. An inescapable component of the provincial responsibility for education, broadly defined, was the responsibility for vocational and technical education. This responsibility was formally recognized as early as 1911, when the Industrial Education Act was passed, bringing technical and industrial schools into existence, and placing them under the immediate jurisdiction of the local school boards. The legislation also included provision for the position of director of industrial and technical training within the Department of Education. In the words of Dupré et al. (p.58)..."the act established the foundations of vocational education (in Ontario), which were to remain essentially unchallenged for half a century. At the time the act placed Ontario in the forefront of Canadian provinces in the provision of technical education."

Over the years Ontario developed vocational schools, passed legislation to encourage and regulate apprenticeship programs, and, in the early postwar period, created institutes of technology. The provincial Department of Education (rather than Labour) assumed responsibility for most such programs, and over many years its expenditures were greatly influenced by federal manpower policies.

Technical and Vocational Training Assistance Act of 1960

Federal policies continued in the same direction in 1960, with the Technical and Vocational Training Assistance Act, which was a response to the sluggish economic growth and

relatively high unemployment of the late 1950's, and the belief that unemployment and skill levels were highly correlated. It greatly expanded the budget for manpower programs, including, for the first time, provisions for retraining not only those who were already employed or about to enter employment, but also those who were faced with the prospect of job obsolescence. By the criterion of dollars spent, TVTA greatly expanded the scope of federal manpower training programs. For the entire period before 1960, federal training expenditures (both capital and operating) were approximately $110 million, while during the six-year lifetime of TVTA, federal operating expenditures alone totalled $259 million. The remarkable expansion was facilitated by the favourable response from most of the provinces which, by this time, had transformed their spending priorities, and were anxious to accept all the federal dollars they could for education.

The Act was specifically directed to encourage a rapid expansion of expenditures on provincial programs and facilities for manpower training. Under the new arrangements the federal government would pay 50 percent of eligible capital expenditures over a six-year period, but for expenditures made during the first two years the federal share would be 75 percent. The federal authorities expected that Ontario would expand its technical institutes somewhat in response to the federal grants. It did that, but it also responded with the "Robarts plan", which dramatically changed

the place of vocational training at the secondary level in the province.

When TVTA was passed, the secondary school system was clearly dominated by the "academic" branch; only 24 percent of high school students were enrolled in vocational programs in 1960. Under the Roberts plan the academic high school concept was discarded, and the school curriculum dramatically modified to recognize three basic "streams": arts and science (the academic stream), business and commerce, and science, technology and trades. Of these, only the arts and science stream involved students in spending less than 50 percent of their time "developing occupational qualifications". Hence all capital requirements associated with the development of the other two streams were made eligible for the federal capital grants. Furthermore, local school boards, while free to expand as they wished, were given a particular incentive to expand the facilities for technical and vocational education, since the provincial government offered to pay in full the 25 percent of the costs not already covered by the federal government.

With an incentive of such dimension, the local authorities responded dramatically. Altogether, 124 new schools and 52 additions were submitted for approval in the first year of the federal-provincial agreement, and a further 46 new schools and 3 additions in the second year. By the end of TVTA, the proportion of high school enrolment in vocational or technical programs had nearly doubled,

increasing to 46 percent of the total.

The expansion of vocational and technical programs at the secondary level carried with it the implicit promise of a corresponding expansion of counterpart programs at the postsecondary level within the following few years. While the province was formulating in specific terms its plans for that level of the system, the federally provided incentives under TVTA encouraged the immediate expansion of facilities for the training or retraining of unemployed adults. The provincial response in Ontario took two parts. In the first, the administration was decentralized by assigning responsibility to local school boards. The local boards then made use of the newly expanded vocational training facilities at the secondary level by opening them for the use of adults on evenings and Saturdays. The resulting Adult Education Centres naturally developed highly diversified programs of varying quality. In 1966 more centralized control was imposed on the programs by the Department of Education. The other part of the provincial response was in the expansion of training programs over which the province exercised considerable curriculum control from the beginning. The initial expansion took place in the Provincial Institute of Trades in Toronto, where excess capacity had resulted from the continuing decline in enrolment in apprenticeship programs, and then extended to other centres. The new centres were called Ontario Vocational Centres.

The expansion of vocational and technical training

at the secondary school level, and the creation of institutes
of technology, of Adult Education Centres, and of the Ontario
Vocational Centres, meant that Ontario had in place by the
mid 1960's a considerable range of vocational and technical
training programs. Many of the programs were only recently
in place, and largely the result of the availability of
federal funds. Nonetheless the programs were, in fact,
creatures of the provincial government, all administered by
the Department of Education.

A natural completion of the provincial educational
system was the full-fledged extension of the vocational and
technical stream to the postsecondary level and the further
accommodation of adults who would benefit from training or
retraining. By the mid 1960's, that was exactly the role to
be played by the network of community colleges which was then
at the planning stage. A 1965 amendment to the Department of
Education Act authorized the minister to "establish, name,
maintain, conduct and govern colleges of applied arts and
technology that offer programs of instruction in one or more
fields of vocational, technological, general and recreational
education" (Dupré et al.,p.77). The legislation provided no
details, but in introducing the bill the Minister of
Education, William Davis, stated that it went "...far to
making a reality of the promise -- indeed the stated policy
-- of this government to provide through education and
training... the fullest possible development of each
individual to the limit of his ability" (Dupré et al.,p.78).

He stated further: "Now, having put in train our plans for
other areas of our school system, we can focus our attention
on the design of this remaining section, directly related to
the applied arts and technology, for full-time or for
part-time students, in day and in evening courses, and
planned to meet the relevant needs of all adults within a
community, at all socio-economic levels, of all kinds of
interests and aptitudes, and at all stages of educational
achievement." In further elaboration of his vision, he said
"I have no intention of permitting any group of young people
to be forgotten or deprived, or of any group of adults
needing retraining for a new world of work in a new age to be
neglected" (Dupré et al.,p.78). While putting the system of
community colleges in place was work for the future, it was
clear that the provincial grand design was in place in 1965.
It was also clear that it rested in significant measure on
the assumed continued flow of federal funds through the
Province's Department of Education.

Thus when Prime Minister Lester B. Pearson told a
Federal-Provincial Conference in October 1966 that the era of
cost-sharing and conditional grants in education was soon to
end, the premiers, including especially the Premier of
Ontario, were caught completely by surprise. At that time it
was announced that the federal government would terminate its
existing arrangements in support of education, and combine a
transfer of both personal and corporate tax points to the
provincial governments with fiscal provision to contribute at

least fifty percent of the cost of postsecondary education in each province. The federal government thereby attempted to extricate itself from the jurisdictional problems and political sensitivities associated with making direct expenditures in support of education.[1]

Occupational Training for Adults

While withdrawing from the existing programs in support of education, the federal government placed great emphasis on "the national economic priorities which are the inescapable concern of the federal government" (Dupré et al.,p.26) by creating a program of occupational training for adults. The federal constitutional authority to do so was based on "its time-honoured right to exert its spending power on behalf of any particular class of individuals." (Dupré et al., p.26). The individuals in this case were adults, and the program was designed as part of the federal role in managing the economy (through the training of adults), and was to be based on the federal government's assessment of the desirable volume of training in specific occupations. The program was to be operated by the newly created Department of Manpower and Immigration. In the view of the federal government, all the components of its grand design for a manpower policy were now in place, and it was in a position to exercise full and sole control over manpower policies in Canada: it would decide what training was to be provided, who would receive it, and where.

The grand design of the provincial educational

system, including especially its vocational wing, was clearly
at variance with the grand design of the federal manpower
training program. Indeed, while the provincial plans were
laid on the foundation of continued federal funding, the
federal government was attempting to reduce its funding of
the provincial educational system (for which it got little
credit), to avoid interfering with provincial educational
priorities, and to create instead a more flexible system
under which it could pursue more specific manpower programs
of its own devising. But the province had done much to
establish the institutional base for providing manpower
training programs, and its plans for the CAATs were far
advanced. If the federal government would not commit itself
to the use of the provincial facilities, enormous excess
capacity would result. Thus the grand designs of the two
levels of government clashed dramatically.

The subsequent history of the program is a
fascinating tale in which the federal grand design to
extricate itself from questionable interference in
educational poicy, while assuming a leading role in manpower
policy, founders on the slippery rocks of poor planning and
divided jurisdictional responsibilities. The intention of
the federal program was to provide a vehicle to influence the
volume of training in specific occupations, in accordance
with perceived manpower needs. In practice the "needs" could
not be forecast with reasonable accuracy. But perhaps more
importantly, the federal government, in its great haste to

put the program in place, agreed, in Ontario at least, to
extend its coverage far beyond its original intent, to allow
the province to act effectively as exclusive broker for all
training services within its boundaries, and to give the
provincial authorities great latitude in determining the
costs of programs offered. Thus the federal government
became the purchaser of a product over which its control was
quite limited, and its ability to negotiate directly with the
suppliers of the product greatly restricted. The Adult
Occupational Training Act came into effect in 1967. It
undoubtedly represented a substantial departure from the
original federal plans, largely, of course, to satisfy
provincial objections. The net result was the rather
unwieldly and expensive instrument for federal manpower
planning that we have today.

Institutional and Industrial Training

        Working within the framework established in 1967,
and as modified by subsequent legislation and agreements with
the provinces, the federal government now provides support
for training which takes place in institutions of education
and for training which takes place in the offices and
factories of employers. The record of public statements
makes it clear that the official policy of the Government of
Canada in recent years has been to shift the emphasis in
manpower training away from institutional and towards
employer-centered training. For example, when appearing
before the Committee on Labour, Manpower and Immigration in

early 1977, Bud Cullen, the Minister of Manpower and
Immigration, stressed that

> "The government has been doing its
> best to increase the portion of
> training done in industry rather
> than in training institutions. As
> members know, in the past five years
> funding for industrial training has
> increased from $10 million to the
> proposed level of $70 million for
> 1977-78. Moreover, some $100
> million of institutional training
> costs are for apprenticeship
> training which is really another
> form of industrial training."
> (Labour, Manpower and Immigration,
> 2nd, 30th, p.7:10).

Two years later, in an appearance before the Board of
Economic Development Ministers, Mr. Cullen said

> "the federal government fully
> supports the recommendation that
> greater emphasis be placed on
> 'on-the-job' training." (Board of
> Economic Development Ministers,
> p.17).

This theme, of preferring more industrial and less
institutional training, has been a recurrent one. It has
been supported by various ministers both before and after Mr.
Cullen, including Ron Atkey, who was Minister during the
brief period of Progressive Conservative government. One of
Mr. Atkey's stated goals was to

> "...develop new programs for what we
> call critical skills trades
> training, that is to provide
> through apprenticeship or other
> programs on-the-job training, which
> sometimes can take two or three

> years to have qualified people
> available to do jobs in Canada so
> that it becomes less necessary to
> import qualified labour to perform
> these jobs, which has been a
> historical pattern that has been
> far too frequent in this country."
> (Labour, Manpower and Immigration,
> 1st, 31st, p.4:25).

However, the record of achievement indicates that success in
this regard has been only modest, as evidence by data
presented in the next chapter.

At the Ontario level it is clear that manpower
training programs have developed largely as one aspect of the
educational policies of the province. More recently,
however, the province has come to take a more direct interest
in the employment aspects of manpower policy. This interest
culminated in the creation, in 1979, of the Ontario Manpower
Commission charged, in the words of the Minister, "to oversee
all of the Manpower programs and activities of the government
and, subject to Cabinet concurrence, to make policy and
operational decisions concerning these programs." (Ontario
Debates, 3rd, 31st, pp. 3225-6).

The first Chairman of the Commission, Donald
Pollock,.carried out the Commission's mandate in an
aggressive manner, and has made some pointed comments about
the role of the private sector:

> "The part we are finding interesting
> is that the private sector is just
> glossing over its responsibilities.
> The initial thrust of the Commission
> - and we have been doing it through
> a paper called 'The Private Sector

> Role in Training' - is to get the
> private sector interested now. We
> haven't succeeded in the past, but
> we want to get them to recognize
> that they were a significant
> contributor to this problem and that
> the only way it is going to be
> resolved is if they would be equally
> significant contributors to its
> solution." (Resources Development,
> 3rd, 31st, p. R-1189).

There are substantial problems in the way of
increasing the amount of industrial training, as the federal
government has been learning. The difficulty seems to lie in
the area of incentives: as we argue in Chapter 4, private
employers may have rather little incentive to pay any of the
costs of training unless the skills imparted are quite
specific to their requirements, and not generally of value to
other employers. The Canada Manpower Training Program is
intended to provide general, rather than employer-specific
training: it would seem inappropriate in most circumstances
for government funds to be used to support skill development
when the skills would be of value only to one or a few
business firms. Nevertheless, it should be recognized that
the present scheme may simply provide insufficient inducement
to individual employers to elicit the overall response by
industry that the government professes to desire.

2. THE ROLE OF IMMIGRATION IN MANPOWER POLICY

The role of immigration in Canada was the subject
of intense debate in the latter half of the decade of the

1970s. The Green Paper on Immigration Policy was tabled in parliament in early 1975 and discussed in detail by the Special Joint Committee of the Senate and of the House of Commons on Immigration Policy. Numerous interested and affected individuals and groups appeared before the Committee. The question of labour market requirements was of great importance to the Committee members. Statements from various ministers, both before the Joint Committee and subsequently, have reaffirmed the government's view that it is actively managing the immigration program, keeping the domestic labour market in mind.

Federal-provincial cooperation in the area of immigration was formalized on February 20, 1978, when Mr. Cullen tabled the immigration agreements entered into between Canada and the Province of Quebec and Canada and the Province of Nova Scotia. One aspect of these agreements is the protection of the right of immigrants to move between provinces.

In Ontario, the main concern with immigration seems to have been with the necessity to fill vacancies in the skilled manpower area. As reported by the Honourable Larry Grossman, the Ontario government

> "...program provides for a full range
> of services, including ascertaining
> specific areas where certain skills
> can be found; advising on and
> placing international
> advertisements; arranging
> interviewing programs; expediting
> immigration documentation; and

> providing prospective employees and
> immigrants with updated information
> on Ontario.
>
> This program is now used by Ontario
> employers who need their gaps in
> skilled job areas filled for the
> short term.
>
> . . .
>
> For the year ending 1978, 1,026
> skilled and technical immigrants
> were brought into Ontario under the
> Selective Placement Service
> Program." (Ontario Debates, 3rd,
> 31st, p. 1187).

4. SOME CONCLUDING OBSERVATIONS

The effective implementation of manpower policies
has been made difficult in Canada by the constitutional
division of powers, with education the responsibility of the
provinces and economic management in large measure the
responsibility of the federal government. In practice, it is
hard, and probably undesirable, to keep manpower training
separate from the general educational system, and it is clear
that the federal government and the provincial governments
have had difficulties in establishing effective manpower
programs as a result. The federal government, which has the
recognized authority in this area, has been forced to work
through the agencies of provincial government in attempting
to implement its policies. In consequence, its goals have
often been frustrated, and provincial goals with respect to
educational policy have been greatly influenced, frequently
in unintended directions.

The stated wish of both the Government of Canada and the Government of Ontario has been to shift manpower training away from institutional and towards employer-centred training activities. More generally, both governments have professed to desire greater involvement by industry. That wishes have not led to very significant results is a fact that is documented in the next chapter. As we have noted, and as we discuss further in Chapter 4, the reason would seem to be related to a lack of incentive for private employers to incur even partial costs in the provision of training that is not highly specific to their labour requirements.

The role of immigration in manpower policy has been clearly recognized for many years. Both federal and provincial governments have emphasized its importance, but it appears that short-term manpower requirements may have dominated the longer-term implications of immigration. At the same time, the scope for using immigration as a tool of manpower policy is limited by the preferential treatment accorded nominated relatives and by unpredictable inflows of immigrants admitted for humanitarian reasons.

Immigration of foreign nationals is squarely under the control of the federal government. There have been consultations with provincial governments and formal attempts at coordination, but immigration as an instrument of manpower policy remains effectively in federal hands. Emigration, on the other hand, is virtually uncontrolled by any level of government. Moreover, provinces are affected by migration of

population within Canada, as well as by migration to and from
other countries. In principle, the federal government may
influence internal migration by offering mobility assistance
and provincial governments may exert some influence also.
However, in practice it seems highly likely that government
influences are relatively minor in Canada, and that most
internal population movement takes place in response to
incentives provided by underlying economic forces. The
effects of language and education policies in Quebec probably
represent a significant exception. Rent controls which may
induce housing shortages, differences in welfare schemes
which may draw people from one area to another, climatic
differences, and so on, are all potential influences.
Nevertheless, broader economic forces probably dominate.
Also, to the extent that government policies do affect
internal migration, the effects may often be unintended. As
a matter of deliberate policy control, government influence
on population movements within Canada is probably slight.

FOOTNOTE TO CHAPTER 2

1. At the Federal-Provincial Conference in October 1966,
   Prime Minister Pearson announced that an additional four
   points of the corporate income tax would be made
   available to the provinces "in recognition of the fiscal
   needs of the provinces for postsecondary education". The
   abatement was tied to a floor provision under which the
   federal government would supplement the equalized yield
   from the tax points so as to contribute 50 percent of the
   cost of postsecondary education in each province. The
   federal government stance with respect to provincial
   educational expenditures became neutral: while the
   federal government would continue to provide substantial
   (though reduced) funding it would no longer encourage
   particular types of programs. (See Dupré et al., pp.
   24-5.)

CHAPTER 3

AN INVENTORY OF MANPOWER PROGRAMS IN ONTARIO

1. INTRODUCTION

The aim of this chapter is to provide an inventory of the different types of manpower programs that are operative in Ontario. The inventory is based on an extensive search of various information sources. The problems of data acquisition were formidable in many cases but we have attempted to provide as comprehensive a compilation as possible relating to relevant programs and training facilities available within the province, outside the regular school system. In addition, we provide some summary data relating to manpower training in other countries, for purposes of comparison.

Section 2 is concerned with an overview of federal government programs and some international comparisons. Section 3 provides a description of the Canada Manpower Training Program. Immigration as a source of manpower is discussed in section 4 and particular Ontario government programs are described in section 5. Sections 6-8 deal with training activities within the public service, training activities within the armed forces, and other training activities in the private sector of the economy. Section 9 offers some concluding remarks.

2. AN OVERVIEW OF FEDERAL GOVERNMENT MANPOWER PROGRAMS AND SOME INTERNATIONAL COMPARISONS

The historical development of Canadian manpower programs was reviewed in the last chapter. We turn now to consider those federal programs which were in place at the end of the 1970s or the beginning of

the 1980s, and to consider the recent levels of expenditures associated with them.

In organizing the data for Canada, and also for other nations to be compared with Canada, we have found it convenient to draw initially on a survey conducted by the Working Party on Employment of the Organization for Economic Co-operation and Development (OECD). The survey, which is entitled "Inventory of Employment and Manpower Measures", divided all relevant expenditures into four categories: (a) labour demand measures; (b) labour supply measures; (c) mutual adjustment of labour supply and demand; and (d) income maintenance.

The Canadian response to the survey for the fiscal year 1978-79 is presented in Table 3-1. The largest program by far falls under the category of income maintenance, which in Canada means unemployment insurance payments; such payments accounted for about 75 percent of the total budget. The programs under the heading labour demand are mostly of a job creation sort, designed largely as counter-cyclical measures to deal with problems of short-term unemployment. For our purposes, the major interest is with the remaining two categories -- labour supply and mutual adjustment of supply and demand. Among the supply programs listed, the three called "industrial training", "institutional training", and "Unemployment Insurance funds for training" comprise the bulk of the Canada Manpower Training Program (CMTP) which, in turn, accounts for more than 90 percent of the supply program expenditures. The CMTP is discussed further below.

Among the adjustment programs, the activities of the Canada Employment Centres are clearly the most important. Including the student

and on-campus centres, expenditures on the CMCs represented more than 88

percent of the total. The major purpose of the centres is to match job

vacancies to the available supply of people seeking employment. The

centres also screen individuals for training programs where that is judged

appropriate. Worthy of note too is the Canada Manpower Mobility

program, which provides grants to qualified individuals to defray

part of their expenses in moving from their current places of residence

to other locations where employment is available.

Government agencies in other OECD countries responded to the

same survey, and selected information from their responses for the

supply, demand, and mutual adjustment programs is provided in Table 3-2.

Subject to the uncertainties about how the various governments might

have classified their programs in response to the survey, it appears

that the Government of Canada spends a relatively small fraction of its

manpower program budget on demand and adjustment programs, and a relatively

high proportion on labour supply programs. When expenditures on these

programs are expressed relative to either total government expenditures or

total national product, Canada ranks seventh among the ten OECD nations

surveyed. However, we note that while these figures are suggestive, they

should be treated with caution. Different jurisdictional responsibilities

of the central governments in various nations, coupled with differences in

what are classified as manpower programs, may well have affected the ranking.

3. THE CANADA MANPOWER TRAINING PROGRAM[1]

The Canada Manpower Training Program is the major element of

manpower policy in Canada. The program is operated in partnership with

the provinces and territories and is administered through the Canada Employment Centres across Canada. Two avenues of training are utilized; one is institution-based and the other employer-centered.

(1) <u>Institutional Training</u> involves the purchase of courses from community colleges and vocational schools. Full-time trainees receive either a training allowance or unemployment insurance payments, and may also be eligible for other allowances to assist with dependent care or certain travelling or commuting expenses. The types of institutional training courses offered may fall into any of the following categories:

Skill training	pre-employment courses, providing trainees with fundamental entry-level skills in a particular occupation
Language training	courses offered primarily to new immigrants who have difficulty finding employment because of lack of fluency in English or French
Basic training for skill development (BTSD)	courses designed to upgrade basic skills in mathematics, science, and communication to meet the academic requirements for entry into skill training, as well as for persons proceeding directly to employment
Job readiness training (JRT)	courses offered to chronically unemployed workers or persons who have been out of the labour force for a prolonged period; courses may include elements of "life skills", work experience, job orientation and academic upgrading
Work adjustment training (WAT)	courses offered to workers who are encountering behavioural difficulties; courses provide assistance in acquiring appropriate work habits, attitudes, etc.
Apprenticeship training	the classroom training component of apprenticeship programs offered by the provinces

(2) Employer-Centred Training has two main components, the Canada Manpower

Industrial Training Program (CMITP) and Critical Trade Skills Training (CTST).

(a) CMITP is a training program in which the costs are shared

with employers; it aims to meet the skill needs of employers

and to improve the employability and earning capacity of

workers through expansion and improvement of employer-provided

training.

(b) CTST is a new industrial training initiative which focuses on

selected highly skilled trades and occupations. Its objective

is to encourage industry to develop and expand the training of

Canadian tradesmen or workers in skilled occupations which

experience chronic shortages.

Under both initiatives (CMITP and CTST), the Commission negotiates contracts

with individual employers or groups of employers, and agrees to reimburse

them for a proportion of specified costs incurred by providing training.

Data relating to the Canada Manpower Training Program are

provided in Tables 3-4 to 3-12. Table 3-4 provides information on the

annual expenditures on major components of the overall program. (The CMTP

expenditures reported in this table and subsequent ones are exclusive of

the administrative costs associated with the programs.) As indicated in

the table, total CMTP expenditures grew substantially over the period

1975-76 to 1980-81: they were 63 percent higher at the end than at

the beginning. However, much of the increase is illusory, since the

rate of inflation was high. If one were to use the consumer price

index as a rough indicator of the purchasing power of CMTP expenditures,

the measure of their real value increased by only about 10 percent. We note also that the institutional component of CMTP expenditures decreased (in line with the stated policy, as outlined in the previous chapter) from 90.0 percent to 83.2 percent. If expenditures on apprenticeship programs are included in the industrial component, rather than in the institutional component (as the Minister of Manpower and Immigration argued should be the case; see Chapter 2), the measure of institutional expenditures decreased from 78.1 percent in 1975-76 to 75.3 percent in 1979-80.

The numbers of trainees started under the various CMTP programs are reported in Table 3-5. The total is 21 percent greater at the end of the period than at the beginning. In 1975-76, those in employer-centred training accounted for about 21 percent of all trainees starting programs; by 1980-81 they accounted for close to 28 percent. Again, if those in apprenticeship programs are counted in the industrial program, the proportion increased from 39.5 percent in 1975-76 to 45.1 percent in 1979-80. It remains clear, however, that institutional training continued to account for the bulk of expenditures, and the majority of those receiving training.

In Table 3-6 are provided the expenditures by province under each of the major programs for the fiscal year 1979-80. Somewhat less than one third (31.5 percent) of all CMTP expenditures were made in the Province of Ontario. Furthermore, Ontario was very close to the national average in its shares of expenditures which go to institutional training on the one hand, and to employer-centred training on the other. In terms of trainees started, 26.3 percent of the total were in Ontario, as shown in Table 3-7. Since Ontario accounted for 31.5 percent of the budget but

only 26.8 percent of the trainees started, expenditure per trainee was higher in Ontario than in all of Canada. (We note that in Ontario there is a relatively heavy concentration of trainees in full-time institutional programs.) In 1979-80, the average expenditure per trainee started in Ontario was $2541, while the average for the rest of Canada was $2026.

Tables 3-8 through 3-10 provide further information for each of the provinces on the institutional training component of the CMTP for the fiscal year 1979-80. Table 3-8 focuses on the expenditures by detailed type of program. The distribution of expenditures in Ontario was quite similar to that for all of Canada, though the proportion in skill training, BTSD, and apprenticeship training was somewhat lower, and that in job readiness training and work adjustment training somewhat higher. Among those taking full-time institutional training, the Ontario average course duration was only one day longer than the average for Canada. At the same time, there is a much greater concentration of trainees enrolled in courses of average duration in Ontario than in Canada as a whole. The completion rates for those enrolled in full-time institutional training is reported in Table 3-10. For Canada as a whole, the average completion rate is only 82 percent, ranging from 63.5 percent in the work adjustment training program (WAT) and 65.5 percent in the job readiness training program (JRT), to 97.9 percent in the apprenticeship program. Completion rates for Ontario are similar, though generally somewhat lower. The low completion rates in many of the programs is certainly a cause for concern. Is there a problem with the screening process in admitting individuals to particular programs? Do many individuals quit because they find that the programs are not well suited to their particular needs?

Table 3-11 provides information for each province on the termination status of the industrial component of CMTP, for the fiscal year 1979-80. Of the total of more than 32 thousand trainees who left the industrial training program, over 66 thousand completed some training and the remainder -- almost 16 thousand, or 19.3 percent -- quit the program without completing it. The situation in Ontario is quite similar. In 1979-80, almost one termination in five took place without completion of the training program in which the individual was registered.

Some expenditure figures are brought together in Table 3-12, for each of the regions for the fiscal year 1979-80, and for Canada as a whole for each year from 1975-76 to 1980-81. The average cost of training per trainee started is reported, both for institutional training and in total. For all Canada, the average cost per trainee started increased from $1874 in 1975-76 to $2164 in 1979-80, and to a preliminary estimate of $2530 in 1980-81. The increases appear not to be very substantial when one takes into account the extent of price inflation during the period. As noted above, the completion rate in training programs is about 80 percent. In 1979-80, then, the average cost per trainee completed is approximately $2700. In institutional training alone the corresponding figure is somewhat more than $3100.

Turning to the regional cost figures for 1979-80, they range from a low of $1844 per trainee started in British Columbia to a high of $3262 in the Yukon Territories. Ontario is the second highest, at $2541. Per capita expenditures on the institutional component vary substantially among the regions, with Ontario about $280 above the national average of $2515.

It is difficult to know whether these costs are high or low,
relative to the costs associated with other educational institutions
or other training programs. However, it may be of interest to note that,
in 1979-80, expressed on a full-time equivalent basis, the average cost
(including all allowances) per institutional trainee completion in Canada
was about $3660, or somewhat more than $43 per day of training.[2] That
figure appears high; for example, it exceeded by a fairly wide margin the
tuition cost of attendance at private schools. However, it includes a
component of living allowances, as well as the direct training costs
themselves, and comparisons must be interpreted with caution.

4. IMMIGRATION AS A SOURCE OF MANPOWER

Immigration has been an important source of manpower in Canada
and in Ontario. Information relating to immigration in recent years is
provided in Tables 3-13 and 3-14. Table 3-13 contains figures for the
total number of immigrants to Canada and the total with Ontario as their
intended destination, from 1961-62 to 1978-79. In Table 3-14, immigrants
to Ontario who planned to enter the labour force are classified by intended
occupation.

Table 3-13 indicates that although immigration to Canada and
Ontario has fluctuated over the years, Ontario's percentage share of the
national total has remained relatively stable. The low point occurred in
1976-77, when Ontario was the intended destination of only 48 percent of
all immigrants, while the high point occurred in 1970-71, when the pro-
portion was 56.3 percent.

The intended occupations of those immigrants coming to Ontario
are important for our purposes, and relevant data are provided in Table

3-14. The numbers presented in Table 3-14 relate to calendar years and are, therefore, not strictly comparable to those in Table 3-13, which relate to fiscal years. Moreover, the data in Table 3-14 end in 1977 because definitions were changed at that time, and it is not possible to present a comparable occupational breakdown for the subsequent period. We see, from Table 3-14, that the intended occupations "professional and technical" and "manufacturing and mechanical" were the two largest categories in every year, accounting together for some 40 to 50 percent of the total. Those in the "clerical" and "service and recreational" categories accounted for another 25 percent or more of the total, while the remainder were distributed across a wide range of other occupations. It is not known how many immigrants succeed in finding employment in their intended occupations. Nonetheless, if data for intended occupations are even roughly reliable, it appears that the skill and educational content of immigration to Ontario has been high.

5. ONTARIO GOVERNMENT PROGRAMS

As noted in Chapter 2, manpower training programs have been operating in Ontario for several decades, and it is, to some extent, a matter of judgement whether particular programs are federal or provincial in origin, since many programs were defined in specific terms by the provincial government in order to lay claim to federal government conditional grants, or to take advantage of various federal government cost-sharing schemes. However, over the past decade and a half, the federal government has made little use of such schemes, and the Government of Ontario had developed some programs which are clearly its own. A brief description of each of the programs follows and data

relating to the associated expenditures and enrollments are provided
in Tables 3-15 and 3-16, respectively.

(1) Ontario Training in Business and Industry Program (TIBI)

The objectives of this program are to encourage short-term skill
upgrading for unemployed people, to help increase productivity, and to
assist smaller businesses. The training must be relevant to the occupation
identified and the duration of the program is from 10 to 240 hours. Each
industrial client can claim up to a limit of $10,000 per fiscal year for
training assistance under this program. The program does not pay any
wages to trainees. Most of the Ontario Government's share of the expendi-
tures goes towards the salaries of teachers, who may be employees of the
participating company or who may be employed by a college of applied arts
and technology.

All training is of the classroom type, as distinct from training
on the job. When classroom space is provided by the company, the value
goes towards accounting for part of the company's contribution of two-thirds
of the cost of the training. When the company is unable to provide
space, however, classes are held in a local college of applied arts
and technology. The colleges are responsible for approving all
training courses carried out under the program, regardless of whether
they are given on site or in the colleges.

(2) The Youth Employment Service (YES)

This program is designed to assist disadvantaged youth of
ages 14 to 21 to find and obtain meaningful employment. Clients must
be referred to YES by the Children's Aid Society, a doctor, a lawyer,
or other qualified professional person.

(3) Ontario Career Action Program (OCAP)

The purpose of this program is to provide work experience for younger members of the labour force which will improve their prospects for finding full-time employment. It provides on-the-job training for young people aged 16 to 24. The maximum duration of training period is 16 weeks and employees are paid $100 a week by the government.

(4) Student Venture Capital Program (SVC)

SVC is intended to stimulate young people to learn how to run a small business. Interest-free loans of up to $1,000 per venture are made available to students aged 16 and over. The program is administered through the local Chamber of Commerce (or equivalent) and the Royal Bank of Canada. These institutions evaluate applications and provide some instruction to successful applicants on how to run a small business.

(5) Employer-Sponsored Training (EST)

Under the terms of EST, industrial training committees are established in interested communities to determine the amount and type of training required. In discussing this program the Minister of Labour, Robert Elgie, said

> "...Most training will occur in the work place
> and employers will be reimbursed for their
> approved training costs. This plan will allow
> employers to help develop a pool of skilled
> workers without running the risk of losing their
> investment in training if the trainee leaves to
> work elsewhere." (Ontario Debates, 2nd, 31st,
> pp. 3161-2).

(6) Junior Forest Ranger Program (JFR)

This program provides summer training for people interested in work in the Ministry of Natural Resources.

(7) Junior Conservationist (JC)

This is a summer program which is funded by the Ministry of
Natural Resources.

(8) Students in Industrial Relations (STIR)

STIR is a summer program which is funded by the Ministry of
Labour.

(9) Students in Personnel (STIP)

This is also a summer program funded by the Ministry of Labour.

(10) Junior Agriculturalists (JA)

The Ministry of Agriculture and Food operates this summer
program.

(11) Experience Program (EP)

The intention of EP is to alleviate youth unemployment in the
summer by providing career-related job experience through the employment
of young people in various Ontario Government Ministries. Ministries submit
proposals which are reviewed by experienced program administrators. Once
a proposal is accepted, funds are allocated to the particular Ministry,
which then assumes responsibility for administration. Jobs created last
from eight to sixteen weeks. All youth employed in the program receive
the minimum wage.

(12) Ontario Youth Employment Program (OYEP)

OYEP is also intended to alleviate youth unemployment by creating
new jobs. Under this program, a $1.25 per hour subsidy is provided for an
employee who is placed in a newly-created job. The subsidy is given to
the employer. The employer must "prove" that the job has been
created (for example, by hiring more people this summer than last
summer). The employee must be 15 to 24 years of age and cannot be a

relative of the employer. The job must be located in Ontario. The
employee must work between 25 and 40 hours per week for the employer to
be eligible for the subsidy and the job must exist for at least six weeks.
The program operates for approximately 25 weeks in the period April to
October.

Tables 3-15 and 3-16 provide expenditure and enrolment data
for the foregoing programs for the period from 1974 to 1979. TIBI is
the only program which appears to be concerned mainly and significantly
with training as a means of raising the skill level of the labour force.
(Perhaps Employer-Sponsored Training should also be included in this
category, but there has been little experience with it.) The other
programs are, in our opinion, concerned more with job creation than
with skill development. It is, therefore, of particular interest
to note that while enrolment in TIBI has accounted for a large but
declining portion of enrolment in all Ontario Government manpower
programs, the budget has grown little over the years, and has fallen
from 21.9 percent of provincial expenditures on manpower programs in 1974
to only 4.6 percent in 1980. This fall in the TIBI percentage has been a
concomitant of the vast increase in expenditures on the Experience Program
and the Ontario Youth Employment Program.

6. TRAINING ACTIVITIES WITHIN THE PUBLIC SERVICE

Discussions of manpower training often ignore the fact that
much training takes place within the government service, at both the
federal and provincial levels, and constitutes an important component of
training in Canada. As an indication of the extent of training within
the government service at the federal level, we present Tables 3-17 to
3-19. (Unfortunately, it has not proved possible to determine how much

of the federal training has taken place in the province of Ontario.)
Table 3-17 provides data relating to expenditures made by the Government
of Canada for the training of its own employees during the fiscal years
1976-77 and 1977-78, the latest years for which data were available.
(The figures do not include training on the job, which no doubt is also
extensive.) It is evident from the tables that training activity within
the federal public service is very considerable. In both 1976-77 and
1977-78, expenditures on such training were equivalent in amount to about
15 percent of total expenditures under the Canada Manpower Training
Program.

Table 3-18 indicates that federal public service participation
in training programs increased greatly between 1974-75 and 1977-78. (Again,
no figures were available for more recent years.) As an indication of the
magnitude of these programs, we note that, in 1976-77, the number of
federal government employees who participated in the programs (other than
on-the-job training) was equal to more than 43 percent of the total number
of persons who enrolled in CMTP programs, and in 1977-78 the figure was
53 percent. In addition, over the period 1973-74 to 1977-78, a yearly
average of 285 federal government employees took educational leave for
continuous periods of at least six months, as reported in Table 3-19.

Training of persons in the employ of the Government of Ontario
is also of substantial proportions. As Table 3-20 indicates, training
was undertaken, in varying degrees, in all of the Ministries surveyed in
an unpublished 1978 survey.

7. TRAINING ACTIVITIES WITHIN THE ARMED FORCES

The Canadian Armed Forces operate a very large training system, many of the graduates of which soon enter the civilian sector. Table 3-21 indicates the number of in-service courses taken during the 1976-77 fiscal year. Data for the Maritime, Mobile and Air Commands relate to courses which are specific to skills required in fulfilling the command role. Training offered by the Canadian Forces Training System includes recruit training, trade specialist training, and officer classification training, all of which are relevant to more than one of the commands. A major task of the System is the training of recruits (approximately 11,000 in 1976-77). It also provides continuing training for regular and reserve force personnel in more than 400 different courses, ranging in duration from a few days to over a year. The category "other" relates to such courses as drug abuse training, alcohol abuse training, and the training of personnel selection officers.

In 1976-77, almost 8,000 man-years of training were provided, in total, in the in-service courses, with an average course duration of approximately 42 training days.[3] Of particular interest is the high success rate achieved by service trainees. In addition to the in-service courses, members of the armed forces participate in training given by the language schools, staff colleges, staff school, and management development school, training that is subsidized under the University education program, post-graduate studies, and out-service courses. The latter are courses which are provided under contract by community colleges or industry, and which are attended by one or two individuals at a time. In total, then, it is clear that a very large amount of training is

provided within the armed forces. Unfortunately, the total cost of such training is not readily available.

It is hard to assess what portion of training in the armed forces is portable to civilian activities, but clearly some of it is directly useable, and many who receive training soon leave the forces. The biggest loss of trained personnel occurs among those individuals trained in computer technology and in various aspects of air command. The latter loss is kept down somewhat by bonding provisions which are applicable to people who have completed flying training. Bonding provisions also exist for individuals who attend staff colleges and who take the subsidized university programs.

8. OTHER TRAINING ACTIVITIES

The amount of training carried out in individual firms is difficult to ascertain, and no measure is available concerning the overall extent of training provided by industry. Nonetheless, it is desirable to be reminded, in this inventory chapter that firms do provide training. Some recent research allows us to look, in an illustrative fashion, at the extent of training in a sample which includes a number of private firms as well as a few government organizations. Table 3-22 presents a summary of data gathered by Professors I.A. Litvak and C.J. Maule for a project carried out on behalf of the Commission of Inquiry on Educational Leave and Productivity. It will be noted that although the expenditures vary considerably across organizations, training appears not to be an important item in the planning and budgetary processes of most of the 13 organizations represented here. It must be recognized, however, that there are enormous difficulties in defining and comparing training expenditures across diverse organizations.

Finally, we note that the role played by the private training establishment is often forgotten in surveys and analyses of manpower training. In 1978-80, there were more than 160 private training establishments in the Province of Ontario carrying out training almost entirely at the expense of those being trained.[4] It has not been possible to ascertain the total numbers trained, the completion rates, the total expenditures, or the subsequent activities of those trained. However, there is reason to think that private training establishments represent a significant component in the overall range of training facilities available in Ontario. The apparent strength of private training programs suggests that a voucher scheme -- which would permit qualified individuals to purchase training for themselves -- may well be a viable policy option.

9. CONCLUDING REMARKS

We have attempted to bring together a large body of data relating to manpower training activities in Canada and in Ontario. Unfortunately, we have not been able to consolidate the data into a few tables, or to arrive at a meaningful total for expenditures on all programs combined. The data proved to be too heterogeneous, uncoordinated, fragmentary, and difficult to come by for that to be possible. In light of our rather frustrating experience in trying to assemble and compare the data from various sources we are led to suggest that it would be highly desirable for some agency of government to undertake the task of coordinating and standardizing training information on a continuing basis. If manpower policy is considered important, one would hope that steps could be taken to improve the data base available for future statistical assessments of such policy. We are tempted to suggest also

that the present lack of a comprehensive, centralized, and consistent data set is a reflection of a lack of coordination of the programs themselves; proper and effective coordination of manpower policy would surely require a much better information base than now seems to exist.

What is clear from the data that we have been able to draw together is that a great deal of money is spent on training programs outside of the regular educational system. A very large fraction of that money comes from federal government sources, a much lesser fraction from provincial government sources. It is unknown how much private industry spends on training programs. Indeed, as a practical matter it may be very difficult to distinguish much of training from simply learning on the job in the course of working. Nevertheless, a greater effort to obtain new and better data in the future is very much to be recommended; one has the impression that it has been more lack of interest than practical difficulties that has resulted in the present unsatisfactory state of information about training activities.

In the case of government training expenditures, there is reason for concern that the money may not be spent effectively. We have noted that the expenditure level per trainee completed appears relatively high. We have also noted that there is a continuing emphasis on institutional training, even though governments themselves, and virtually all informed commentators, agree that a substantial change in emphasis towards more employer-centred programs would be desirable. Even as recently as the 1980-81 budget estimates, more than 83 percent of expenditures under the Canada Manpower Training Program were classified as institutional.

FOOTNOTES TO CHAPTER 3

1. The definitions and data in this section were taken directly from
   Annual Statistical Bulletin, Canada Manpower Training Program,
   1979-80, Ottawa, December 1980.

2. The calculation was done as follows. The total institutional
   training expenditure was $567.3 million, and 176,483 were enrolled
   in full-time studies and 49,144 in part-time. If it is assumed that
   four part-time trainees represent one full-time equivalent, the total
   full-time trainee equivalents started was 138,769. The average cost
   is then $3,006. With an average completion rate of 82 percent, the
   average cost per completion is $3,662, and with an average duration
   of 84 days, the average cost per day per trainee completion is $43.60.

3. The figure is unpublished. It was provided by the Department of National
   Defence.

4. Ontario Ministry of Colleges and Universities, Horizons, undated,
   pp.129-33.

TABLE 3-1: INVENTORY OF EMPLOYMENT AND MANPOWER MEASURES, CANADA, 1978-79

MEASURES	BUDGET OR EXPENDITURE (millions of dollars)	SCOPE (rounded figures)
Labour Demand		
- Affirmative Action	0.3	n.a.
- Canada Works (Community based component)	210.6	55,000 persons
- Canada Works (Economic growth component)	23.4	3,000 work-years
- Employment Tax Credit	100.0	50,000 persons
- Federal Labour Intensive (FLIP)	99.0	22,000 persons
- International Exchange	n.a.	2,000 persons
- Local Economic Development (LEDA)	n.a.	n.a.
- Local Employment Assistance (LEAP)	24.1	4,200 persons
- Indians, Metis and Inuits Rights in Employment	n.a.	n.a.
- Women's Rights in Employment	n.a.	n.a.
- Regional Development Incentives	70.0	n.a.
- Summer Youth Employment	94.5	60,000 persons
- Work Sharing	1.3	3,200 persons
- Young Canada Works	42.0	27,500 persons
- Youth Job Corps	15.0	6,400 persons
Labour Supply		
- Canada Agricultural:		
(i) Federal-Provincial Agreements	0.7	n.a.
(ii) Agriculture for Young Canadians	n.a.	n.a.
(iii) Farm Labour Pools	3.1	n.a.
(iv) Foreign Seasonal Workers	n.a.	n.a.
- Development Use of UI Funds for Job Creation	5.0	500 persons
- Industrial Training (CMITP)	83.7	73,700 trainees
- Institutional Training	551.4	207,500 trainees
- Job Experience Training (JET)	48.3	41,000 persons
- Job Exploration by Students (JES)	2.1	4,000 persons
- Outreach	9.7	n.a.
- UI Funds for Training	134.0	80,000 persons
Mutual Adjustment of Supply and Demand		
- Canada Employment Centres	125.0	n.a.
- Canada Employment Centres for Students	7.1	293,000 persons
- Canada Employment Centres On-Campus	2.8	115,000 persons
- Canada Manpower Mobility	10.7	45,500 grants
- Employment Counselling Services	3.0	n.a.
- Federal Support of Cooperative Education	0.75	n.a.
- Integration of Canada Employment Centres (CESs)	n.a.	n.a.
- Inter-Occupational Mobility	0.1	n.a.
- Manpower Consultative Services	2.6	252,300 persons
- Occupational Forecasting	n.a.	n.a.
- Youth Employment Centres	1.0	n.a.
Income Maintenance		
- Unemployment Insurance	4,769.9	2,526,000 persons
All programs	6,312.6	

NOTE: The figures relate to the financial year 1978-79 except Employment Tax Credit (1979-80), Work Sharing (1978), Young Canada Works (1978), Canada Employment Centres for Students (1979), Canada Employment Centres on Campus (1979), and Unemployment Insurance (1978). The Unemployment Insurance figures are preliminary. The total figure for "All programs" is not quite complete, since expenditure figures for some programs are not available. We note also that the expenditure of UI funds for Training is reported not only under Labour Supply but also under Income Maintenance; it is counted only once in the total.

n.a. indicates data not available.

SOURCE: Organization for Economic Cooperation and Development, Working Party on Employment, Inventory of Employment and Manpower Measures: Canada, Paris, March 1980.

TABLE 3-2: PERCENTAGE DISTRIBUTION OF EXPENDITURES ON MANPOWER PROGRAMS IN SELECTED OECD COUNTRIES (VARIOUS YEARS)

COUNTRY	LABOUR DEMAND MEASURES	LABOUR SUPPLY MEASURES	ADJUSTMENT OF LABOUR SUPPLY AND DEMAND
Austria (1976)	89.2	8.2	2.6
Australia (1979-80)	12.6	56.8	30.5
Canada (1978-79)	40.9	50.0	9.1
West Germany (1976)	39.8	10.7	49.5
Ireland (1977)	79.5	5.3	15.2
Japan (1976)	52.9	30.6	16.5
Norway (1976-77)	94.1	5.2	0.7
Sweden (1976-77)	65.1	27.5	7.4
U.K. (1977-78)	61.1	17.8	21.1
U.S. (1978)	59.5	24.2	16.3
Average of Percentages	59.5	23.6	17.0

NOTE: Totals may not add to 100.0 due to rounding.

SOURCE: O.E.C.D. Working Party on Employment, Inventory of Employment and Manpower Measures (various countries, various years).

TABLE 3-3: MANPOWER EXPENDITURES AS A PERCENT OF GROSS NATIONAL PRODUCT
AND OF TOTAL GOVERNMENT EXPENDITURES

COUNTRY	% OF GNP	% OF GOVERNMENT EXPENDITURES
Austria (1976)	0.18	1.02
Australia (1979-80)	0.39	2.37
Canada (1978-79)	0.73	3.56
West Germany (1976)	2.89	24.68
Ireland (1977)	2.57	14.05
Japan (1976)	0.11	1.1
Norway (1976-77)	1.34	7.47
Sweden (1976-77)	2.97	10.84
U.K. (1977-78)	2.03	8.6
U.S. (1978)	1.61	7.85
Average of Percentages	1.48	8.15

NOTE: For West Germany, Norway, Sweden, and the U.K., gross domestic product
(GDP) is used rather than GNP; for West Germany government expenditures
are defined to include social security and central and local government
expenditures.

SOURCES: O.E.C.D., Working Party on Employment, Inventory of Employment and
Manpower Measures (various countries, various years), and O.E.C.D.,
Economic Surveys (various countries, various years).

TABLE 3-4: CANADA MANPOWER TRAINING PROGRAM, EXPENDITURES, CANADA, 1975-76 TO 1980-81

TYPE OF PROGRAM	1975-76 millions of dollars	percent	1976-77 millions of dollars	percent	1977-78 millions of dollars	percent	1978-79 millions of dollars	percent	1979-80 millions of dollars	percent	1980-81 (3) millions of dollars	percent
INSTITUTIONAL TRAINING												
- Purchases (1)	269.4	53.2	285.3	52.1	302.2	51.1	331.7	52.0	345.9	51.6	395.5	48.0
- Allowances (2)	186.3	36.8	200.2	36.5	190.8	32.3	117.0	18.4	84.2	12.6	102.3	12.4
- UI funds for training	-	-	-	-	18.9	3.2	102.7	16.1	137.3	20.5	188.0	22.8
- Training Improvement	2.2	0.4	2.7	0.5	2.5	0.4	2.3	0.4	0.1	0.0	-	-
- Total Institutional	457.9	90.4	488.2	89.1	514.4	87.0	553.7	86.9	5o7.5	84.8	685.8	83.2
EMPLOYER-CENTERED TRAINING												
- Industrial (CMITP)	48.7	9.6	59.5	10.9	76.7	13.0	83.7	13.1	101.3	15.1	109.6	13.3
- Critical trade skills (CTST)	-	-	-	-	-	-	-	-	0.9	0.1	29.3	3.5
TOTAL	506.6	100.0	547.7	100.0	591.1	100.0	637.4	100.0	669.7	100.0	824.7	100.0

NOTES: (1) Includes Provincial Administration, 1975-76 to 1979-80, and Prior Years' Settlements, 1975-76 to 1977-78.
(2) Includes Living-Away-From-Home Allowance, Half-Time Allowance, Trainee Travel Allowance and Commuting Allowance, 1975-76 to 1979-80, Youth Apprentice Training Allowance, 1977-78 and 1978-79, and Dependent Care Allowance, 1979-80.
(3) Expenditures are main estimates.

A dash (-) indicates no expenditure.

SOURCE: Employment and Immigration Canada, Annual Statistical Bulletin, Canada Manpower Training Program, 1979-80, Ottawa, December, 1980.

TABLE 3-5: CANADA MANPOWER TRAINING PROGRAM, TRAINEES STARTED, CANADA, 1975-76 TO 1980-81

TYPE OF PROGRAM	1975-76		1976-77		1977-78		1978-79		1979-80		1980-81[1]	
	number	%	number	%	number	%	number	%	number	%	number	%
INSTITUTIONAL TRAINING												
- Total Full-Time	175,628	65.0	177,337	59.7	179,241	59.9	162,156	56.6	176,483	57.0	185,000	56.7
- Part-Time	37,588	13.9	59,144	19.9	50,438	16.8	45,402	15.8	49,144	15.9	51,000	15.7
- Total Institutional	213,216	78.9	236,481	79.6	229,679	76.7	207,558	72.4	225,627	72.9	236,000	72.4
EMPLOYER-CENTERED TRAINING												
- Industrial (CMITP)	57,058	21.1	60,788	20.4	69,698	23.3	78,936	27.6	83,334	26.9	82,473	25.3
- Critical Trade Skills (CTST)	-	-	-	-	-	-	-	-	502	0.2	7,528	2.3
TOTAL	270,274	100.0	297,269	100.0	299,377	100.0	286,494	100.0	309,463	100.0	326,001	100.0

NOTE. (1) Trainee figures are estimates.
A dash (-) indicates no trainees.

SOURCE: Employment and Immigration Canada, Annual Statistical Bulletin, Canada Manpower Training Program, 1979-80, Ottawa, December, 1980.

TABLE 3-6: CANADA MANPOWER TRAINING PROGRAM, EXPENDITURES, CANADA, THE PROVINCES AND THE TERRITORIES, 1979-80.

REGION	INSTITUTIONAL TRAINING		EMPLOYER-CENTERED TRAINING		TOTAL		EXPENDITURE IN REGION AS % OF CANADA TOTAL
	million of dollars	% of total in region	millions of dollars	% of total in region	million of dollars	% of total in region	
NEWFOUNDLAND	22.8	88.6	2.9	11.4	25.8	100.0	3.9
PRINCE EDWARD ISLAND	5.6	83.2	1.1	16.5	6.8	100.0	1.0
NOVA SCOTIA	22.7	79.4	5.9	20.6	28.6	100.0	4.3
NEW BRUNSWICK	21.6	79.9	5.4	19.8	27.1	100.0	4.0
QUEBEC	161.6	86.8	24.5	13.1	186.1	100.0	27.8
ONTARIO	176.8	83.8	34.2	15.9	211.0	100.0	31.5
MANITOBA	22.8	82.9	4.6	16.9	27.5	100.0	4.1
SASKATCHEWAN	19.1	81.8	4.2	17.1	23.3	100.0	3.5
ALBERTA	53.1	89.5	6.2	10.5	59.4	100.0	8.9
NORTH WEST TERRITORIES	2.2	78.6	0.6	21.4	2.8	100.0	0.4
BRITISH COLUMBIA	57.0	82.7	12.0	17.3	69.0	100.0	10.3
YUKON TERRITORY	2.0	82.6	0.4	17.3	2.4	100.0	0.4
CANADA	567.5	84.7	102.2	15.1	669.7	100.0	100.0

NOTE: Percentages may not add to 100.0 and Canada totals may not be the sum of the region components due to rounding.

SOURCE: Employment and Immigration Canada, Annual Statistical Bulletin, Canada Manpower Training Program, 1979-80, Ottawa, December, 1980.

TABLE 3-7: CANADA MANPOWER TRAINING PROGRAM, TRAINEES STARTED, CANADA, THE PROVINCES AND THE TERRITORIES, 1979-80

REGION	INSTITUTIONAL TRAINING				EMPLOYER-CENTERED TRAINING		TOTAL FOR REGION	
	full time	part time	total	% of total in region	total	% of total in region	number	% of Canada total
NEWFOUNDLAND	6,142	518	6,660	61.5	4,177	38.5	10,837	3.5
PRINCE EDWARD ISLAND	1,679	272	1,951	64.8	1,061	35.2	3,012	1.0
NOVA SCOTIA	9,431	105	9,536	65.0	5,128	34.9	14,664	4.7
NEW BRUNSWICK	7,263	354	7,617	60.1	5,063	39.9	12,680	4.1
QUEBEC	32,877	42,355	75,232	78.1	21,122	21.9	96,354	31.1
ONTARIO	58,865	4,350	63,215	76.1	19,804	23.9	83,019	26.8
MANITOBA	7,300	563	7,863	63.1	4,589	36.9	12,452	4.0
SASKATCHEWAN	6,184	347	6,531	67.7	3,115	32.3	9,646	3.1
ALBERTA	21,901	162	22,063	80.2	5,442	19.8	27,505	8.9
NORTH WEST TERRITORIES	716	-	716	61.9	441	38.1	1,157	0.4
BRITISH COLUMBIA	23,791	80	23,871	63.8	13,538	35.7	37,409	12.1
YUKON TERRITORY	334	38	372	51.1	356	48.9	728	0.2
CANADA	176,483	49,144	225,627	72.9	83,836	27.1	309,463	100.0

NOTE: Percentages may not add to 100.0 due to rounding; a dash (-) indicates no trainees.

SOURCE: Employment and Immigration Canada, Annual Statistical Bulletin, Canada Manpower Training Program, 1979-80, Ottawa, December, 1980.

TABLE 3-8: CANADA MANPOWER TRAINING PROGRAM, INSTITUTIONAL TRAINING EXPENDITURES BY TYPE OF PROGRAM, CANADA, THE PROVINCES, AND THE TERRITORIES, 1979-80

REGION	FULL-TIME (PURCHASES AND ALLOWANCES)							PART-TIME PURCHASES	OTHER EXPENDITURES	TOTAL EXPENDITURES
	SKILL	LANGUAGE	BTSD	JRT	MAT	APPRENTICE	TOTAL			
	(percentages)									
NEWFOUNDLAND	48.4	1.3	30.9	4.0	0.1	7.6	92.3	0.6	7.1	100.0
PRINCE EDWARD ISLAND	54.7	0.8	18.8	5.7	4.6	4.3	88.9	1.1	10.0	100.0
NOVA SCOTIA	50.7	1.7	19.1	2.4	-	12.9	86.8	0.2	13.0	100.0
NEW BRUNSWICK	57.4	1.6	10.0	5.3	-	14.8	89.1	0.6	10.3	100.0
QUEBEC	60.3	11.3	18.4	2.5	-	1.1	93.6	4.2	2.2	100.0
ONTARIO	47.9	6.8	14.8	3.2	0.7	12.4	85.8	1.4	12.8	100.0
MANITOBA	54.0	1.9	19.4	1.5	0.1	14.6	91.5	1.0	7.5	100.0
SASKATCHEWAN	39.6	4.5	19.9	1.7	0.1	26.4	92.2	0.5	7.3	100.0
ALBERTA	19.9	4.1	9.2	2.9	0.1	54.4	90.6	0.3	9.1	100.0
NORTH WEST TERRITORIES	33.5	-	12.1	11.8	-	26.5	83.9	-	16.1	100.0
BRITISH COLUMBIA	50.5	5.4	13.1	1.5	-	17.3	87.8	0.1	12.1	100.0
YUKON TERRITORY	61.8	1.1	24.5	-	-	0.3	87.7	0.2	12.1	100.0
CANADA	49.9	6.8	16.3	2.8	0.3	13.6	89.7	1.8	8.5	100.0

NOTE: The category "other expenditures" relates to funds allocated under CMP to provide travel costs for trainees who must establish a temporary residence near a training centre and also to defray certain provincial government administrative expenditures. A dash (-) indicates no expenditure.

SOURCE: Employment and Immigration Canada, Annual Statistical Bulletin, Canada Manpower Training Program, 1979-80, Ottawa, December, 1980.

TABLE 3-9: CANADA MANPOWER TRAINING PROGRAM, FULL-TIME INSTITUTIONAL TRAINING, TRAINEES STARTED BY DURATION OF COURSE, CANADA, THE PROVINCES AND THE TERRITORIES, 1979-80

REGION	COURSE DURATION, IN DAYS (percentages)											AVERAGE DURATION PER TRAINEE (days)
	10 OR LESS	11-19	20-29	30-39	40-49	50-59	60-89	90-124	125-174	175-224	225+	
NEWFOUNDLAND	1.0	7.0	15.2	15.9	4.1	5.0	9.4	9.7	6.3	25.7	0.7	95
PRINCE EDWARD ISLAND	2.7	9.3	19.7	15.1	7.4	7.7	9.1	11.1	5.1	11.8	1.0	70
NOVA SCOTIA	6.3	4.7	28.3	10.6	2.7	3.1	10.5	11.5	8.8	10.3	3.2	75
NEW BRUNSWICK	3.4	7.0	22.8	20.0	3.8	4.3	5.2	7.2	5.2	17.3	3.8	81
QUEBEC	3.1	2.6	3.0	3.0	3.2	4.4	18.5	16.7	22.3	16.9	6.3	121
ONTARIO	1.7	2.7	3.5	20.6	14.1	5.0	14.0	17.1	10.1	9.6	1.6	85
MANITOBA	0.6	4.2	17.1	16.6	10.9	3.7	5.3	10.4	6.6	19.8	4.8	95
SASKATCHEWAN	3.4	2.1	4.6	19.8	16.0	7.9	13.6	10.6	9.9	11.0	1.1	81
ALBERTA	0.8	0.7	10.7	41.9	22.9	5.4	6.1	5.0	3.7	2.7	0.1	52
NORTH WEST TERRITORIES	0.4	1.8	9.8	22.4	20.5	5.6	7.6	24.0	3.2	0.3	4.4	70
BRITISH COLUMBIA	9.5	19.2	17.2	11.7	5.0	2.7	10.7	12.3	5.3	5.6	0.8	58
YUKON TERRITORY	3.0	2.4	9.0	3.3	6.3	1.8	4.2	25.4	9.9	34.7	-	126
CANADA	3.2	5.2	9.5	17.7	10.4	4.6	12.3	13.4	10.3	11.0	2.4	84

NOTE: Course duration refers to course days not calendar days and it also indicates the stated length of the course and not the actual time spent in the course. A dash (-) indicates no trainee starts.

SOURCE: Employment and Immigration Canada, Annual Statistical Bulletin, Canada Manpower Training Program, 1979-80, Ottawa, December, 1980.

TABLE 3-10: CANADA MANPOWER TRAINING PROGRAM, FULL-TIME INSTITUTIONAL TRAINING, TRAINEE COMPLETION RATES
BY TYPE OF TRAINING, CANADA, THE PROVINCES AND THE TERRITORIES, 1979-80

REGION	SKILL	LANGUAGE	BTSD	JRT	WAT	APPRENTICE	TOTAL
			(percentages)				
NEWFOUNDLAND	83.1	50.0	55.5	66.1	81.0	98.8	79.7
PRINCE EDWARD ISLAND	84.9	73.3	66.7	68.4	66.7	98.6	81.5
NOVA SCOTIA	81.7	78.3	60.5	73.9	100.0	98.7	83.3
NEW BRUNSWICK	77.9	85.1	54.5	55.7	-	97.8	81.4
QUEBEC	79.7	72.2	74.4	57.9	-	82.6	76.9
ONTARIO	75.2	68.5	67.4	60.8	60.9	97.9	78.9
MANITOBA	72.5	71.8	63.7	72.2	73.9	98.5	80.8
SASKATCHEWAN	78.5	90.5	48.3	68.2	84.6	95.9	81.7
ALBERTA	77.6	69.8	66.6	70.3	83.3	98.3	93.1
NORTH WEST TERRITORIES	70.5	-	62.1	69.9	-	97.5	80.8
BRITISH COLUMBIA	81.2	77.5	65.0	74.8	-	98.4	86.4
YUKON TERRITORY	77.8	100.0	54.3	-	-	100.0	68.8
CANADA	78.1	72.4	67.5	65.5	63.5	97.9	82.0

NOTE: Completion Rate is the total number of completed trainees as a percent of all trainees scheduled to complete. A dash (-)
indicates no trainee completions.

SOURCE: Employment and Immigration Canada, Annual Statistical Bulletin, Canada Manpower Training Program, 1979-80,
Ottawa, December, 1980.

TABLE 3-11: CANADA MANPOWER TRAINING PROGRAM, INDUSTRIAL TRAINING, TERMINATION STATUS OF TRAINEES, CANADA, THE PROVINCES AND THE TERRITORIES, 1979-80

REGION	NUMBER OF TRAINEES COMPLETED	NUMBER OF TRAINEES DISCONTINUED	TOTAL TRAINEES	TRAINEES DISCONTINUED AS % OF TOTAL TRAINEES
NEWFOUNDLAND	3,503	597	4,100	14.6
PRINCE EDWARD ISLAND	870	330	1,200	27.5
NOVA SCOTIA	4,053	971	5,024	19.3
NEW BRUNSWICK	4,286	1,107	5,393	20.5
QUEBEC	15,317	3,683	19,000	19.4
ONTARIO	16,685	4,025	20,710	19.4
MANITOBA	4,913	870	5,783	15.0
SASKATCHEWAN	1,927	702	2,629	26.7
ALBERTA	3,728	1,223	4,951	24.7
NORTH WEST TERRITORIES	433	133	566	23.5
BRITISH COLUMBIA	10,460	2,232	12,692	17.8
YUKON TERRITORY	227	48	275	17.5
CANADA	66,402	15,921	82,323	19.3

SOURCE: Employment and Immigration Canada, Annual Statistical Bulletin, Canada Manpower Training Program, 1979-80, Ottawa, December, 1980.

TABLE 3-12: CANADA MANPOWER TRAINING PROGRAM, TOTAL AND AVERAGE EXPENDITURE LEVELS, CANADA, THE PROVINCES AND THE TERRITORIES, VARIOUS YEARS

	INSTITUTIONAL TRAINING			ALL TRAINING		
	millions of dollars	number started ('000)	average cost (dollars)	millions of dollars	number started ('000)	average cost (dollars)
-- 1979-80 --						
NEWFOUNDLAND	22.8	6.7	3431.	25.8	10.8	2380.
PRINCE EDWARD ISLAND	5.6	2.0	2895.	6.8	3.0	2255.
NOVA SCOTIA	22.7	9.5	2380.	28.6	14.7	1950.
NEW BRUNSWICK	21.6	7.6	2842.	27.1	12.7	2137.
QUEBEC	161.6	75.2	2148.	186.1	96.4	1931.
ONTARIO	176.8	63.2	2797.	211.0	83.0	2541.
MANITOBA	22.8	7.9	2895.	27.5	12.5	2206.
SASKATCHEWAN	19.1	6.5	2923.	23.3	9.6	2420.
ALBERTA	53.1	22.1	2409.	59.4	27.5	2160.
NORTHWEST TERRITORIES	2.2	0.7	3121.	2.8	1.2	2459.
BRITISH COLUMBIA	57.0	23.9	2388.	69.0	37.4	1844.
YUKON TERRITORIES	2.0	0.4	5275.	2.4	0.7	3262.
CANADA	567.5	225.6	2515.	669.7	309.5	2164.
-- CANADA --						
1975-76	457.9	213.2	2148.	506.6	270.3	1874.
1976-77	488.2	236.5	2064.	547.7	297.3	1842.
1977-78	514.4	229.7	2240.	591.1	299.4	1974.
1978-79	553.7	207.6	2668.	637.4	286.5	2225.
1979-80	567.5	225.6	2515.	669.7	309.5	2164.
1980-81	685.8	236.0	2906.	824.7	326.0	2530.

SOURCE: Based on Tables (3-4) through (3-7).

TABLE 3-13: ANNUAL NUMBER OF IMMIGRANTS, CANADA AND ONTARIO, 1961-62 TO 1978-79

YEAR	ONTARIO	CANADA	ONTARIO AS % OF CANADA
1961-62	34,621	70,005	49.5
1962-63	40,155	79,049	50.8
1963-64	55,600	102,356	54.3
1964-65	66,017	121,159	54.5
1965-66	90,661	165,986	54.6
1966-67	116,405	214,258	54.3
1967-68	106,891	204,104	52.4
1968-69	89,142	171,350	52.0
1969-70	88,436	162,495	54.4
1970-71	77,836	138,133.	56.3
1971-72	62,736	117,790	53.3
1972-73	69,234	130,384	53.1
1973-74	119,838	214,288	55.9
1974-75	115,745	212,923	54.4
1975-76	83,796	165,637	50.6
1976-77	68,273	142,156	48.0
1977-78	52,721	106,512	49.5
1978-79*	39,829	82,125	48.5

NOTE: Data for 1978-79 are preliminary.

SOURCE: Statistics Canada, International and Interprovincial Migration in Canada, 1978-79, page 21.

TABLE 3-14: IMMIGRANTS DESTINED TO THE LABOUR FORCE, BY INTENDED OCCUPATION, ONTARIO, 1969-77

INTENDED OCCUPATION	1969		1970		1971		1972		1973		1974		1975		1976		1977	
	number	%	number	%	number	%	number	%	number	%	number	%	number	%	number	%	number	%
Professional and Technical	13,321	(29.1)	10,741	(25.2)	7,564	(23.2)	7,119	(23.0)	9,276	(17.5)	9,620	(16.5)	8,816	(21.1)	5,763	(20.2)	4,436	(19.3)
Managerial - Administration	1,136	(2.5)	1,416	(3.3)	1,538	(4.7)	1,980	(6.4)	2,794	(5.3)	2,906	(5.0)	2,223	(5.3)	2,136	(7.5)	1,886	(8.2)
Clerical	7,119	(15.5)	7,209	(16.9)	5,897	(18.1)	4,936	(15.9)	8,179	(15.4)	9,045	(15.6)	6,599	(15.8)	4,784	(16.7)	3,818	(16.6)
Finance	305	(0.7)	256	(0.6)	208	(0.6)	200	(0.6)	325	(0.6)	322	(0.6)	312	(0.7)	214	(0.7)	182	(0.8)
Sales	1,554	(3.4)	1,531	(3.6)	1,229	(3.8)	1,167	(3.8)	1,878	(3.5)	1,882	(3.2)	1,583	(3.8)	1,065	(3.7)	919	(4.0)
Service and Recreational Workers	4,764	(10.4)	4,099	(9.6)	3,233	(9.9)	3,425	(11.0)	6,888	(13.0)	7,026	(12.1)	4,346	(10.4)	3,078	(10.8)	2,584	(11.2)
Agriculture, Fishing and Logging	1,119	(2.4)	1,034	(2.4)	966	(3.0)	1,116	(3.6)	1,801	(3.4)	1,269	(2.2)	769	(1.8)	569	(2.0)	546	(2.4)
Mining	240	(0.5)	121	(0.3)	83	(0.3)	51	(0.2)	72	(0.1)	66	(0.1)	72	(0.2)	31	(0.1)	23	(0.1)
Manufacturing and Mechanical	10,197	(22.3)	9,612	(22.6)	7,025	(21.5)	6,105	(19.7)	12,952	(24.4)	14,925	(25.7)	9,869	(23.7)	5,908	(20.7)	4,694	(20.4)
Construction	3,582	(7.8)	3,706	(8.7)	2,507	(7.7)	2,304	(7.4)	3,492	(6.6)	3,310	(5.7)	2,019	(4.8)	1,240	(4.3)	1,041	(4.5)
Transportation	356	(0.8)	338	(0.8)	310	(0.9)	327	(1.1)	606	(1.1)	666	(1.1)	513	(1.2)	337	(1.2)	226	(1.0)
Communications	138	(0.3)	130	(0.3)	81	(0.2)	81	(0.3)	143	(0.3)	169	(0.3)	118	(0.3)	81	(0.3)	60	(0.3)
Unskilled Labourers	1,179	(2.6)	956	(2.2)	742	(2.3)	717	(2.3)	1,851	(3.5)	2,897	(5.0)	1,638	(3.9)	909	(3.2)	625	(2.7)
Occupation not stated	711	(1.6)	1,424	(3.3)	1,273	(3.9)	1,476	(4.8)	2,869	(5.4)	4,044	(7.0)	2,811	(6.7)	2,453	(8.6)	1,999	(8.7)
All Occupations	45,808		42,573		32,656		31,004		53,126		58,147		41,088		28,568		23,039	

NOTE: Percentages may not add to 100.0 due to rounding.

SOURCE: Government of Ontario, Ontario Statistics 1979, pages 100-1.

TABLE 3-15: MANPOWER PROGRAMS IN ONTARIO, EXPENDITURE BY PROGRAM, 1974-1980

YEAR	TIBI	YES	OCAP	SVC	EST	JFR	JC	STIR	STIP	JA	EP	OYEP	TOTAL
1974	2,010,000	98,577	-	-	-	-	-	90,000	-	98,000	9,000,000	-	11,896,577
1975	2,600,000	135,910	400,000	31,965	-	2,912,975	49,044	112,000	-	112,072	9,800,000	-	16,153,966
1976	3,000,000	157,959	3,500,000	63,780	-	2,935,800	65,538	187,000	92,000	-	12,000,000	-	22,002,077
1977	3,000,000	170,448	7,000,000	63,850	-	3,020,376	62,481	187,000	173,900	-	15,000,000	9,700,000	38,378,055
1978	3,300,000	247,801	8,800,000	82,525	-	4,227,300	68,621	190,700	163,300	185,500	15,900,000	20,300,000	53,465,747
1979	3,300,000	335,590	9,300,000	94,750	2,500,000	4,341,000	69,549	194,800	190,000	125,000	19,500,000	25,500,000	65,505,689
1980	3,300,000	454,241	9,300,000	136,970	9,800,000	4,454,000	67,400	197,800	110,612	145,439	13,300,000	30,000,000	71,266,462

NOTE: The programs are described in the text, and the abbreviations are defined there also. A dash (-) indicates no expenditure. Figures for TIBI, YES, OCAP, and EST relate to fiscal or program years beginning in the calendar year shown. Most figures are approximations, provided by individuals in various Ministries. YES and EST expenditures include amounts provided by the federal government. The figures reported as expenditures under the SVC Program are, in fact, loans. JFR expenditures include some on capital. EP figures are budget allocations rather than expenditures.

TABLE 3-16: MANPOWER PROGRAMS IN ONTARIO, ENROLMENT BY PROGRAM, 1974-1980

YEAR	TIBI	YES	OCAP	SVC	EST	JFR	JC	STIR	STIP	JA	EP	OYEP	TOTAL
1974	65,902	959	-	-	-	-	-	30	-	200	7,368	-	73,649
1975	71,204	902	186	37	-	1,945	41	40	-	200	7,500	-	83,755
1976	85,544	907	1,200	65	-	1,928	41	40	35	200	9,142	-	99,102
1977	78,154	949	3,600	71	-	1,948	41	55	70	310	11,400	27,500	124,098
1978	80,751	1,414	6,000	97	-	2,526	41	55	85	310	13,288	34,000	138,567
1979	86,873	1,974	7,000	109	250	2,526	41	55	55	280	13,610	43,500	156,298
1980	n.a.	2,852	6,000	146	1,400	2,324	34	55	55	200	10,310	50,000	n.a.

NOTE: The programs are described in the text, and the abbreviations are defined there also; n.a. means not applicable. A dash (-) indicates no enrolment. Figures for TIBI, YES, OCAP, and EST relate to fiscal or program years beginning in the calendar year shown. Most figures are approximations, provided by individuals in various Ministries. The figure reported as SVC enrolment is the number of ventures, each of which may employ more than one person. About six overhead staff people are included each year in the JC enrolment figures. OYEP enrolment refers to the number of subsidized jobs created.

TABLE 3-17: EXPENDITURES MADE BY THE GOVERNMENT OF CANADA TO PROVIDE
TRAINING FOR ITS OWN EMPLOYEES, 1976-77 AND 1977-78

EXPENDITURE	1976-77	1977-78
Participants direct cost[1]	$18,031,046	$16,396,103
Training resources[2]	34,102,693	39,855,223
Participants salaries	28,637,614	36,854,222
Total	$80,771,353	$93,105,548

NOTES: (1) Includes transportation, living expenses, tuition
registration costs, purchase of course materials, etc.

(2) Trainers salary and travel expense, fees for hiring
consultants on non-departmental resources, expenses
from purchase, rental of training equipment supplies,
aids and rental of facilities.

SOURCE: Treasury Board of Canada, Training and Development in the
Public Service 1977-78, Ottawa, March 1979, Table B.

TABLE 3-18: PUBLIC SERVICE PARTICIPATION IN TRAINING ACTIVITIES;
GOVERNMENT OF CANADA, 1975-76 TO 1977-78

FISCAL YEAR	NUMBER OF ACTIVITIES	ANNUAL % INCREASE
1974-75	104,772	-
1975-76	112,542	7.4
1976-77	128,279	14.0
1977-78	158,785	23.8

NOTE: The number of activities is greater than the number of
employees attending training because a number of employees
will participate in more than one activity during the year.

SOURCE: Treasury Board of Canada, Training and Education in The
Public Service 1976-77, Ottawa, April 1978, p.8.

TABLE 3-19:   EDUCATIONAL LEAVE, GOVERNMENT OF CANADA,
1973-74 TO 1977-78

FISCAL YEAR	NUMBER OF EMPLOYEES PARTICIPATING
1973-74	245
1974-75	226
1975-76	312
1976-77	314
1977-78	327

NOTE: "Educational leave" refers to educational or
development activities which are of a duration
of a continuous period of more than six months,
and includes trainees on full salary, part
salary, and those without pay.

SOURCES: Treasury Board of Canada, Training and
Education in the Public Service 1976-77,
Ottawa, April 1978, p.10.

Treasury Board of Canada, Training and
Development in the Public Service 1977-78,
Ottawa, March 1979, p.23.

TABLE 3-20: ENROLMENT OF GOVERNMENT EMPLOYEES IN SELECTED TRAINING PROGRAMS,
GOVERNMENT OF. ONTARIO, VARIOUS YEARS

DEPARTMENT	PROGRAM	ENROLMENT	YEAR
Civil Service Commission	General Courses	2,188	1976-77
		2,570	1977-78
Agriculture and Food	Various		
	a) one week	404	1976-77
	or less	438	1977-78
	b) more than	4	1976-77
	one week	3	1977-78
Attorney General	Various	836	1976
		842	1977
Consumer and Commercial Relations	Various	451	1976-77
		252	1977-78
Correctional Services	Various	2,200	late 1970's
Environment	Various	1,108	1976-77
		1,393	1977-78
Government Services	Various	246	1976-77
		246	1977-78
Solicitor General[1]	Various	85	1976-77
		111	1977-78
Labour	Various	220	1976-77
		229	1977-78
Transportation and Communications	Various	2,536	1976-77
		2,848	1977-78
Treasury and Economics	Various	101	1976-77

NOTE: (1) Data exclude training activities of the uniformed members of the
O.P.P.

SOURCE: Unpublished survey carried out by the Inquiry Commission on Educational
Leave and Productivity, 1978.

TABLE 3-21: IN-SERVICE COURSE AND ENROLMENT DATA, 1976-77

DESIGNATED COMMAND	NUMBER OF COURSES	TRAINEE INTAKE	TRAINEE LOSSES	SUCCESS RATE	TRAINEE MAN-YEARS
Maritime	542	6,100	372	93.9	1,194.5
Mobile	228	5,198	888	82.9	926.2
Air	702	5,615	214	96.2	555.6
Canadian Forces Training System	1,298	27,957	3,515	87.4	5,214.3
Other	29	230	17	92.6	52.7
TOTAL	2,799	45,110	5,006	88.9	7,943.3

SOURCE: Department of National Defence, unpublished data.

TABLE 3-22: ESTIMATED COSTS OF EDUCATIONAL PROGRAMS, SELECTED
            ORGANIZATIONS, 1977-78

ORGANIZATION	(1) COST OF PROGRAM	(2) REVENUE OR PAYROLL	(1) as % of (2)
	(millions of dollars)		
Federal Government of Canada, Solicitor General Department - Canadian Correctional Services	7.0	160.0	4.4
Government of Ontario, Department of Industry and Tourism	.02	10.0	0.2
Regional Municipality of Ottawa-Carleton	.06	33.0	1.8
Canadian National	30.	2,600.0	1.2
Children's Hospital of Eastern Ontario	.11	17.0	0.6
Arthur Andersen and Co.	1.0	13.5	7.4
Ford Canada	.75	5,700.0	.01
Continental Canada	1.0	338.0	.3
Digital Equipment	.02	53.0	.04
Canada Trust	.50	437.0	.01
Winco Steak N'Berger	.01	20.0	.05
R.L. Crain Ltd.	.28	43.0	.7
Mutual Press	.05	3.5	1.4

NOTE: Source document should be consulted for various special features of the
       cost data.

SOURCE: I.A. Litvak and C.J. Maule, Educational Leave Policies and Practices
         of Select Organizations in Canada, prepared for the Commission of
         Inquiry on Educational Leave and Productivity, Ottawa, March 1979,
         pp.14-16.

CHAPTER 4

TRAINING IN THE FIRM

1. INTRODUCTION

The focus of this chapter is on the operations of individual
firms or private employers, and on some of the factors which might be
expected to influence their decisions to provide their own training
programs and, more generally, to encourage the development of skills in
their work forces. We consider also some possible roles for government
in fostering and facilitating training activity within the private sector
of the economy. In subsequent chapters we discuss training from the
perspective of an individual and then from the perspective of the economy
as a whole, and we explore the possibilities for raising aggregate production
and income levels through the introduction or expansion of publicly operated
training programs.

2. THE CASE OF GENERAL TRAINING[1]

Let us start our discussion by considering a firm whose production
requires the use of both skilled and unskilled labour working in conjunction
with certain physical plant and equipment (its capital stock). Let us
assume, for simplicity, that the firm is competitive in the labour market,
and that it can, therefore, hire as many units of either type of labour as
it wishes. If one unit of unskilled labour is as good as another in the
sense that the firm derives no more benefit from an unskilled worker who
has been employed for, say, three years, than it would from another unskilled
worker who has no experience with the firm, then the firm will have no in-
centive to hire more units of unskilled labour than it needs to satisfy its
current production requirements. Similar comments apply to the employment
of skilled workers: if skilled workers currently employed by a firm are no
more productive than other skilled workers who could readily be hired, simply

by paying the market wage, then the firm will not wish to employ more skilled workers than it requires for current production. The assumption that workers not now employed are perfect substitutes for those already hired is a standard one in much economic theorizing, and is appropriately employed in cases in which the knowledge of matters of special value to the firm is easily and cheaply imparted.

With the foregoing in mind, it is useful to consider whether a firm might provide a training program to make skilled some unskilled workers in its employ. It is not obvious at first why a firm would provide such a program. After all, it can, by assumption, hire as many skilled and unskilled workers as it wishes, simply by going to the labour market, and paying market wage rates. No firm will be able to hire for less, nor need any firm pay more; no individual worker need accept less than the going rate for his services, nor could he demand more. Why, in these circumstances, would a firm provide a training program?

The question can be addressed by reference to Figure 4-1. Assume that the going wage rates for unskilled and skilled workers are WU and WS, respectively, and that these rates are expected to hold in the future. The skilled wage rate, as drawn, is considerably higher than the unskilled rate. However, for a given worker to earn WS requires that he undertake a training period of length $t_1 - t_0$. He then expects to earn WS until retirement, at t_2. During the training period no profit-maximizing employer would be willing to pay the trainee as much as WU since the training process itself presumably takes the trainee from currently productive activities. Furthermore, once trained the person who has acquired the skills will be able to command a market wage of WS, and will leave the firm which provided the training unless he receives it. However, a firm would be willing to pay

a training wage WT, equal to the marginal product of the trainee,

exclusive of any direct costs of training.[2]

Would the individual be willing to work at a wage WT during the

training period? The answer depends on a comparison of the total costs

in the training period and the total benefits in the post-training period.

If the benefits exceed the costs (when both have been appropriately dis-

counted to determine their present values) an individual would have an

incentive to pay the full costs of the training program; otherwise he

would not. This matter, including the present value concept, is discussed

more fully in the next chapter.

What of the firm? Would it be willing to provide the training

program? In the simple case that we have considered thus far, the answer

is yes. Even if the firm takes resources from alternative uses during the

training period, it is fully recompensed, and would not care whether such

resources were used for training or for current production. However, the

point to be emphasized is that the competitive firm would stand ready to

provide general training only if the full costs of the training program

were borne by the trainee.[3]

We note that the firm would consider as "general" any component

of the training which would be of benefit not only to it, but also to other

firms in the economy. And it would not find it in its profit-maximizing

interest to pay for the provision of any such training. Either the individual

pays for it, society as a whole pays for it through a tax-subsidy scheme,

or it is not provided.

We conclude that if labour markets are competitive, individuals have

an incentive to provide for their own general training. While they will have

to bear the full costs of that training, they will also reap the full benefits,

in that market forces will ensure that their employers pay them the full amount of their marginal product as skilled workers. Individual firms, on the other hand, will have no incentive to subsidize the training of workers in the acquisition of general skills, though such firms would be willing to make the training available at cost. Also, it is to be expected that some firms will be relatively good at training, in which case they may provide more of it than other firms. Indeed, there is no reason that some firms should not be somewhat specialized in the production of skilled workers while others are more specialized in the production of commodities.

3. THE CASE OF SPECIFIC TRAINING

Some skills and knowledge are of special advantage to one firm and of little or no advantage to others. In such cases a firm would have an incentive to pay the costs of having an individual trained -- that is, of providing specific training -- while the individual would not have any obvious incentive to bear the costs himself. To see this, consider again Figure 4-1. Let us assume that during the training period the trainee's marginal product, net of all training costs incurred by the firm, is WT, and that after training the marginal product of the person who has acquired the specific training is WS when that person is employed in the firm which provided it. However, if the person with specific training were employed elsewhere his marginal product would be WU, the same as that of an unskilled worker, since the specific training is, by definition, of no value to other employers.

Consider now the age-wage profile of such a worker. Recall that in the case of general training, the age-wage profile of the individual corresponded to his age-productivity profile. In the case of specific training, no such pattern is expected, precisely because the training is specific. Once trained, the individual's marginal product is higher than

that of an unskilled worker in the firm which provided the training, but not

elsewhere. And since the skills, though embodied in the worker, are not

transferable to other firms, the firm which provided the training need not

pay its workers with specific training a wage any higher than it pays

unskilled workers. Thus, while unskilled workers may be content to acquire

specific training, they have no assurance that they will share in the benefits;

they will, therefore, not be willing to share the costs associated with such

training. It thus appears possible that the wage profile of a worker with

specific training would be identical to that of an unskilled worker.

There are, however, other considerations which suggest that the

wage of a worker with specific skills will be higher after training, as

is the wage of a worker with general skills. These considerations are

implicit in the profit-maximizing behaviour of firms. It has already been

noted that the turnover of workers with general skills is no problem for the firm

since they can readily be replaced. Such is not the case when a worker with

specific skills quits, since the firm would then have lost its investment:

another employee would be equally valuable to the firm only after undergoing a

period of specific training. For this reason the firm may find it profitable

to enter into a (possibly implicit) contract with its trainees, a contract which

assures the trainees of a higher wage upon completion of the training program.

The higher wage would mean that the benefits of the training would be shared with

those trained. The effect of such sharing would be to reduce the quit rate, and

thereby give the firm a greater assurance of capturing the stream of benefits

which would flow from its investment in specific training. At the same time,

the assurance of a higher wage would produce an excess supply of unskilled

workers willing to enter the training program. The firm could respond by

paying its trainees less than the unskilled wage, and thereby sharing the costs, as well as the benefits, of the training program.[4]

The firm might also attempt to reduce the turnover of employees with specific skills by providing them with fringe benefits which are not transferable to other firms, fringe benefits such as non-vested pension rights, stock purchase options, relatively great job security, and so on. It has often been suggested that such benefits are provided in a differential way to employees with specific skills.

4. GENERAL VS. SPECIFIC TRAINING

While it is undoubtedly the case that some skills are of quite specific advantage to particular firms, and that firms therefore have a profit-maximizing incentive to induce workers to acquire them, it is difficult to get an idea of how much specific training does, in fact, take place. And there is some presumption, as we argue below, that the bulk of training would be properly classified as general. That is, the skills acquired could be utilized just about as effectively in many other firms as they could be in the firm in which the training took place.

Consider, for example, the case of a cabinet maker. If there are many firms with potential interest in hiring cabinet makers, then the market could reasonably be expected to ensure that cabinet makers would earn approximately their marginal products. In this sense, cabinet making must be deemed an example of general training: the skills are not specific to a particular firm. If, however, only one firm employed cabinet makers the training and the skill would be specific. And there are a number of factors which may result in what would otherwise be general training being regarded as specific training, at least for a time. For example,

there may be only one building contractor in a small and remote community, and

he may find it profitable to supply training for some cabinet makers, provided

he can reasonably expect them, once trained, to stay with his firm, and not to

move to another or to set up their own firms and compete with him. In such a

case he may not only subsidize the training, but also pay someone who has

acquired the specific skills a wage above the unskilled rate, high enough to

keep that person from quitting.

While employers of cabinet makers may exercise monopoly power in

certain geographically confined areas, in other industries the monopoly elements,

and the associated specific skills, may be more important. For example,

those who have trained as air traffic controllers may find that their specialized

skills are of little use to other employers; in all Canada there is only one

employer of air traffic controllers. Thus this would appear as a clear case

in which the employee would not be willing to bear any part of the costs of

training without a contract (possibly implicit) providing assurance of employment

after training at a wage rate which would make the specific training itself

worthwhile. However, the employer would be willing to provide such assurance

or, alternatively, to pay for the costs of training only if the employee would

agree to stay with the firm subsequently.

While there are firms which have strong monopoly powers, the

monopoly aspect is usually more prominent in the market in which the product

is sold than in the market in which labour is purchased. In particular, most

skills employed, even by monopolists in product markets, are general skills.

At the same time, it must be recognized that an element of monopoly power

exists in many labour market situations, and may make it profitable for firms

to provide (and pay for) some training. Thus an electronics firm in London

may provide training for workers who could not market such specialized skills without moving to, say, Toronto, or Peterborough. In such cases, geographic immobility may enable an employer to exercise some monopoly power in the local labour market, and thereby to reap some of the benefits of providing what would otherwise be general training. That is, if there are no other potential local employers the firm may be able to pay trained workers less than their marginal products precisely because the training is, in fact, specific training within the geographic area.

No doubt there are important elements of local monopoly power which induce employers acting in their own profit-maximizing interest to provide programs of training. However, if the bulk of such training is potentially transferable to other employers, as we suspect is typical, then such training programs are likely to be short in duration and low in cost. That expectation appears consistent with the extent of industry-provided training which is actually observed.

Specialized skills are also acquired simply by doing a job over a period of time. An employee may well acquire a considerable amount of information which is of particular benefit to his current employer and of little benefit to others. In the course of doing the job, a secretary learns how to deal with suppliers and with other parts of the firm, a computer programmer learns to take advantage of certain unique features of the company computing system, or to avoid problems with it, and so on. Such specialized knowledge is undoubtedly important in the continued smooth and efficient operation of firms. At the same time, the loss of any such employee would not normally cause much disruption; others who had done similar work in the company might be available, or those without experience in the company itself, but with suitable qualifications generally, might be able to acquire the requisite

specific knowledge in short order. In fact, a good indicator of the
extent of specific skills in a given job is precisely the length of the
training period which would be necessary to acquire them. It is our
impression that the length of that period is typically short.

5. GOVERNMENT INVOLVEMENT IN THE TRAINING PROCESS

If it is true that most training is of a general rather than a
specific sort, then it seems clear that firms will have little incentive
to bear the costs of training individuals. It may also be the case that
individuals are not generally willing to undertake (and pay for) that amount
of training which would be judged best from society's point of view. (The
reasons are discussed in the next chapter.) In such circumstances the
question arises whether the government can do anything to encourage a more
appropriate level of training. Here we consider what the government can do
to affect the amount of training provided by firms. In the following chapter
we consider the issue of government policies designed to influence the
training choices of individuals.

Perhaps the most obvious route by which a government can
attempt to influence the amount of training provided by firms is through
a system of subsidies. That is, the government might offer to bear some
of the costs. However, it follows from the earlier analysis that if govern-
ment subsidies were limited to programs of general training, which the firms
could receive only by bearing the remainder of costs themselves, the
subsidies would have no impact on the amount of training provided. The
reason, of course, is that the firm has no profit-making incentive to bear
any portion of the costs of providing general training. On the other hand,

if the subsidies could be used for specific training, firms would simply use public funds instead of their own funds to pay for training which they would have undertaken in any case.

Over the years, the federal and the Ontario governments have devised various schemes under which they have stood willing to subsidize a portion of training expenditures. However, such programs have typically not proved very popular with employers. (See evidence cited in Chapter 2.) This may reflect the general nature of most eligible training. If such funds could be used to provide more specific training, the demand for them might be vastly increased.

If the subsidy-scheme carrot is less than fully successful, the government could look for a more effective carrot., or it could try to make use of the tax stick. More effective incentive schemes may be available, and the search for them should continue if subsidies to firms are to be offered. For example, the government might consider paying the entire costs of training programs. (We are not recommending that, but merely suggesting it as a possibility.) Discussion of a scheme involving taxes is provided in the next section.

We turn now to consider another important role of government. That is in the provision of basic information concerning the stock of skills available in the economy. Such information is critical in framing effective manpower policies. Unfortunately, the present statistical base for such policies is very weak in Canada.[5]

Information on the stock of skills would be of use not only by government in its planning of manpower training programs, but also by private employers.[6] Such information, when combined with a comprehensive projection of future manpower "requirements," could form the basis for discussions

involving government, business, and labour about which manpower programs should be introduced or expanded and which ones reduced or phased out over the next, say, five to ten years.

6. THE TRAINING LEVY SCHEME

The federally appointed Commission on Educational Leave and Productivity recommended recently that a training levy scheme be established in Canada. According to its proposal, any company which spent less than 0.5 percent of its annual payroll on "training leading to legitimate certificates, diplomas, and degrees...would remit the difference to the government. Firms which spent the required sum would have their tax liability reduced by an amount greater than their expenditures" (Adams,1980,p.422). The justification for such a scheme rests, in large part, on the assumption that most training is inevitably general in nature, and therefore that no one firm has the incentive to pay the costs, as we have seen. That does not mean, however, that it would not benefit all firms collectively if such training were provided. Hence the case for social action of the sort proposed.

In designing the training levy scheme the Commission had in mind the advantages of "combining experience and formal training" (Adams,1980,p.426) to enhance work effectiveness. By putting industry in the role of the purchaser of training programs, one would expect the educational institutions to be more responsive to the needs of industry. By requiring industry to purchase training (or to forfeit the funds) one would expect it to examine more systematically its own current and future demands for particular skills, and to satisfy itself that appropriately skilled workers would be available.

The training levy scheme appears to have much to commend it, if a large portion of the responsibility for manpower training is to rest with

industry. Individual firms, even large ones, cannot be expected to provide, or to underwrite on any scale, training programs of long duration when they act individually. However, the proposed scheme would force them to act collectively, and would thereby change the incentives. The major question is whether the responsibility for manpower training should be significantly shifted to private industry, and away from government. At the moment it appears that almost all formal training programs are heavily subsidized by the government, that they are provided at the post-secondary level, and that the content of them is little influenced by industry. The existence of such programs discourages the development of alternative ones in the private sector, and encourages industry to "make do" with what is available. Greater direct participation of industry in the development and financing of training programs would seem both desirable and overdue. The training levy scheme would provide a vehicle by which government could ensure greater participation of industry, and allow concerns about potential profitability to play a much more effective role in the allocation of training dollars, while simultaneously reducing its own high level of direct involvement in manpower training programs.[7]

7. CONCLUDING REMARKS

We have argued that most vocationally-oriented training is necessarily of a general sort. That is, a person who has such training can use it equally effectively with a variety of employers, not with just one. Thus employers typically will not find it in their profit-maximizing interest to bear the costs of helping individual employees acquire skills. But if employers do not find it worth their while to bear the costs, who will?

The analysis in the next chapter suggests that typical individuals may also find insufficient incentive or lack the necessary access to financial resources to enable them to bear the costs of training. If, as a result of market failure, both firms and individuals lack the necessary incentives or opportunities to invest in what would be profitable training, a role is suggested for government intervention.

The training levy scheme which has been proposed would require firms to spend money on training, and give them the incentive to see that the training which they purchase is of a suitable quality and is provided at minimum cost. One characteristic of the proposal is that it would not entail a higher level of government involvement in the funding and operation of post-secondary institutions. On the contrary, it could well reduce government involvement while increasing that of industry.

wage rate,
marginal product

WS

WU

WT

t_0 t_1 t_2

time
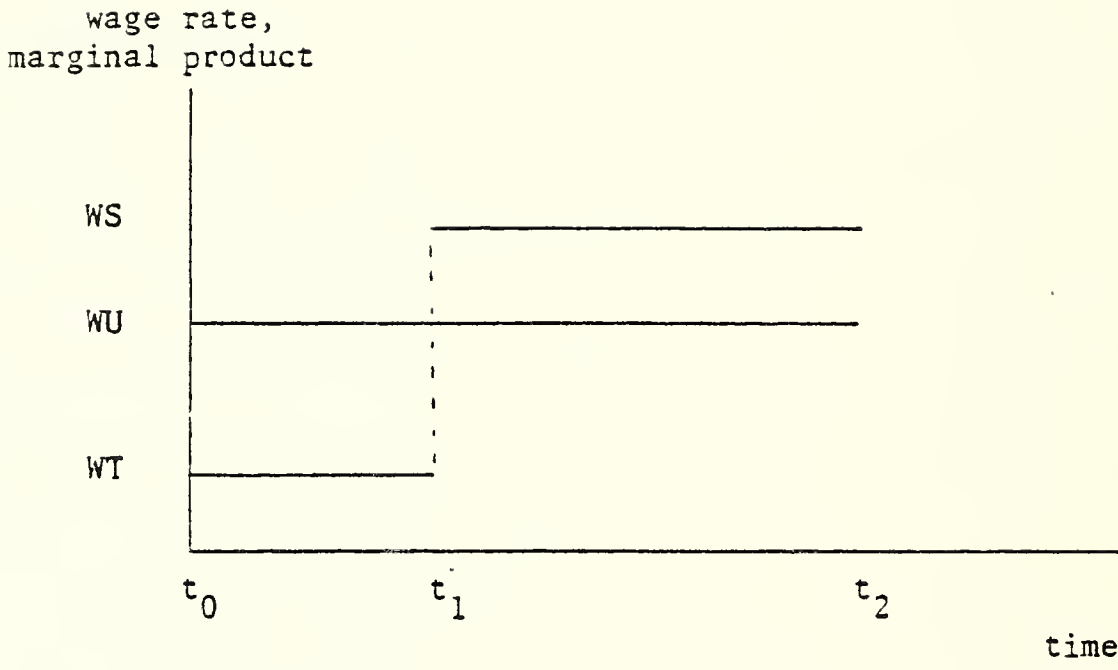
Figure 4-1:   Earning Paths of Skilled and Unskilled Workers

FOOTNOTES TO CHAPTER 4

1. The analysis in this section and in the next two owes much to the work
   of Gary Becker, who suggested the important distinction to be made
   between general and specific training. See Becker (1962,1975).

2. The difference between the unskilled wage and the training wage would
   be the opportunity cost of the individual (his current wages foregone).
   This opportunity cost would be greater the higher are the firm's
   direct costs in providing training.

3. It is realistic to assume that not all potential trainees are equally
   able to acquire the skills which are imparted by a training program.
   Some will learn more quickly than others, thereby requiring less
   expenditure to train, and perhaps also being of greater benefit to the
   firm during the training period. Thus firms would wish to screen
   potential trainees, and to accept only the most promising.

4. The suggestion that the costs and benefits of specific training are
   shared by employers with employees in order to reduce turnover is
   usually attributed to Becker (1962,1975), but others concur with his
   interpretation. (See, for example, Oi (1962), Telser (1972), Parsons
   (1972), and Rees (1973).) Donaldson and Eaton (1976) disagree with the
   sharing interpretation; they argue that employers can inhibit turnover
   without sharing the gains with employees.

5. The possibility of an inventory of manpower skills has been suggested by
   various people and organizations, including the Canadian Council of
   Professional Engineers (1981), Collyer (1980), and Rygus (1980).

6. It has been suggested that corporations often give insufficient attention
   to the future availability of skilled manpower when planning large-scale
   expansions of facilities. See, for example, Rygus (1980), Newton,
   Betcherman, and Meltz (1981), and Denton (1981).

7. Specific features of a training levy scheme should be analysed much
   more closely before implementation. For example, it has been suggested
   to us that it might be desirable to place the levy on total costs
   rather than just payroll costs, to avoid influencing relative factor
   prices. However, this too would require careful consideration.

CHAPTER 5

TRAINING AND THE INDIVIDUAL

1. INTRODUCTION

We consider now some of the factors which influence training decisions by individuals. An individual may be confronted by a mass of information (or misinformation) regarding options available and their perceived advantages or disadvantages. Some of the "signals" that he receives may suggest conflicting directions, and he may have difficulty sorting out what is ultimately relevant from what is not. Some occupations have more "prestige"; others may have the prospect of higher earnings in the near future but more uncertainty about the distant future. Social and psychological factors bear on an individual's choice, as well as economic factors. However, we are concerned here only with economic ones. Specifically, we shall examine the circumstances which determine whether an individual would think it to his advantage to take training, or to enter one occupation rather than another, based solely on economic considerations.

The most straightforward case arises when the individual has available to him all relevant information concerning the implications of choices and there are no market imperfections to be taken into account. This case is analysed in section 2. In section 3, we consider a variety of situations in which the individual's environment is less than ideal and he confronts a more restricted choice set. We then consider, in section 4, some ways in which government might provide assistance by altering the environment.

2. DECISION MAKING IN AN "IDEAL" ENVIRONMENT

We start by considering the case of an individual who can choose whether or not to take a training program when the consequences are fully and correctly anticipated, and no market impediments of any sort interfere. Following the argument of the previous chapter, we limit discussion to the case of general training, so that the market for the skill is well established, and the trained individual can be confident of receiving as wages the full amount of his marginal product.

Assume that the wage rate for skilled workers is WS, that training requires one period, that during the training period the gross wage rate is WT (which may be zero), and that the cost of training an individual is CT. Furthermore, assume that the wage of unskilled workers -- those who do not take the training -- is WU. How will an individual respond to this information?

Let us consider the consequences of each of the two possible courses of action. Without training, the individual will earn WU in every remaining period of his working life. Let us assume that there are n such periods before retirement. The present value of the future income stream which would be available with no further training is

$$PVU = \sum_{i=1}^{n} \left(\frac{1}{1+r}\right)^{i-1} WU_i$$

where r is the rate of interest. It is clear that PVU will be greater the longer the period over which the discounting takes place and the lower the rate of interest.

The present value of the income stream from unskilled employ-
ment should be compared with the present value of the corresponding
stream from skilled employment, PVS. The latter is calculated inclusive
of wages during the training period, WT, and net of training costs, CT:

$$PVS = WT - CT + \sum_{i=2}^{n} \left(\frac{1}{1+r}\right)^{i-1} WS_i = \sum_{i=1}^{n} \left(\frac{1}{1+r}\right)^{i-1} WS_i$$

where $WS_1 = WT - CT$ is the wage paid during the training period (WT), net
of training costs borne by the individual (CT). The individual will
prefer training if PVS exceeds PVU.

This choice is illustrated in Figure 5-1 for the simplified
case in which the individual may choose between two periods of work
without training and one period involving training followed by one period
of skilled work. Consider the consumption choices which are open to
the unskilled worker on the assumption that he will spend all his wage
income over the two periods. In the first period he could consume the
entire amount of his income earned in that period (WU_1), he could save
some or all of it for consumption next period, or he could borrow against
next period's income to consume more than WU_1. The maximum possible
consumption in period 1 is $[WU_1 + WU_2/(1+r)]$. Similarly, in the hypothetical
case in which all consumption is postponed to the second period, consumption
then could exceed wage income by the amount of interest earned. Of course
the individual need not choose such extremes. He could, instead, choose
any linear combination, including consuming in each period the income
earned in that period. The set of consumption choices available to the

unskilled worker is represented by all points on the line CU. For the

individual who takes training, first-period income (net of training costs)

is WS_1 (assumed equal to one-half WU_1) and second-period income is WS_2

(assumed equal to twice WU_2). The resulting set of consumption choices

available to the skilled worker in the two periods is indicated by the

line CS.

Given the illustrative values employed in the figure, it is

clear that a worker who trained would have a higher lifetime income, and

hence would enjoy a higher level of lifetime consumption. Thus one

would expect a person in such a situation to choose the training option.

In this idealized world he has nothing to lose. While his current income

is relatively low, his current consumption need not be. In fact, one

implication of the analysis is precisely that the time allocation of

consumption (as distinct from its overall level) is quite independent

of the time allocation of income, since agents are free to borrow or

lend, as they wish, at the going market rates. This is a standard result

from the lifecycle theory of consumer behaviour.[1]

Other illustrative values might be chosen for Figure 5-1, and

clearly they would change, to an extent, the relationship between CU

and CS. However, the two lines would remain parallel, assuming the market

rate of interest to be the same.

It is helpful at this stage to introduce a second diagram to

depict the situation in the overall labour market in which there are

just two types of labour. In each period of the two-period analysis

there is a downward sloping demand curve for the services of each

skill type. Departing slightly from the usual one-period demand

curve, we construct a curve representing the present value of current

and future labour demand. It differs from the usual labour demand

curve only in that future marginal products (and hence wage rates)

are discounted to their present values and included in the amount

represented on the vertical axis. We refer to such demand curves as

"present value demand curves" and label them PVDS and PVDU in Figure

5-2. Values of PVS are measured on the left vertical axis and values

of PVU on the right one.

In the figure PVS_a is some arbitrary value of PVS, and under

the assumptions of the theory it is also the present value of the

marginal products of skilled labour in the two periods; NS_a is the

corresponding amount of skilled labour demanded in each period. PVU_b

and NU_b are defined in a similar manner for unskilled labour. The

length of the horizontal axis represents the fixed labour supply of the

economy (N), which must equal the number skilled (NS) plus the number

unskilled (NU) plus the number in training (NT). NS is measured from

left to right on the horizontal axis and NU from right to left. NT

is the difference between N and NS + NU.

Consider the relationship between the opportunities available

to the individual, represented in Figure 5-1, and the situation in the

economy as a whole, represented by Figure 5-2. The present value of

the amount which employers are prepared to pay skilled workers, PVS_a,

is equal to the present value of the consumption of such workers, repre-

sented by the curve CS of Figure 5-1; there is a similar relationship

between PVU_b and CU. The advantage of acquiring skills is reflected in the difference between PVS_a and PVU_b.

When the present value of the consumption level available to skilled workers exceeds that available to others, there exists a continuing incentive for more individuals to train. The result, in the aggregate, is that, as more people train, the return to training falls. Consider Figure 5-3, which reproduces Figures 5-1 and 5-2. As more people train, the (present value) wage rate for skilled workers falls below PVS_a and the rate for unskilled workers rises above PVU_b. This causes CU_b and CS_a to come closer together in the lower part of the figure. Such changes will continue until the present values are equalized and no further incentive exists. The equilibrium position is indicated by the subscript e. As compared to the initial situation, the equilibrium involves more skilled workers with lower lifetime incomes and fewer unskilled workers with higher lifetime incomes. In the equilibrium situation, the present value of income over the working life is the same for all workers, whether they choose to be trained or not. This long-run implication results from the assumption that all individuals are equally capable of being trained and that their decisions are determined entirely by the desire to obtain the maximum command over consumption goods.

3. DECISION MAKING IN A "LESS-THAN-IDEAL" ENVIRONMENT

It is obvious that when individuals consider whether to enter a training program the conditions may differ markedly from those assumed above. For example, an individual may not be able to borrow or lend with ease, information regarding even the current income (let alone the

future expected income) of skilled workers may not be available, the

individual's job prospects may not be known with certainty, all

individuals may not be equally able, and so on.[2]

Consider first the case in which an individual cannot readily

borrow against future income, which is no doubt a common situation.[3]

An extreme but perhaps typical version of this case is one in which

current consumption is limited to current income plus savings which

have been accumulated over past periods. However, accumulated savings

are likely to be quite small for young people contemplating training

programs, which means that consumption during training would be

effectively limited to the low income level associated with that

period. In the two-period model, an individual confronting such

imperfections in the capital market would not choose between CU and

CS of Figure 5-1, but between CU' and CS' of Figure 5-4. Now the

decision regarding training is less obvious. The imperfection in

the capital market serves to bind consumption expenditures more closely

to current income receipts. Some individuals may decide to train, and

thereby choose a consumption point somewhere along CS'. Others will

decide not to train, and thereby choose to consume along CU', above

the point where it intersects a line projected from WS_1. (Below that

point on CU', all would prefer to train, since more consumption would

be possible in each of the two periods.)

The self-selection process which results in some taking

training and others not may reflect, in part, differences in taste.

It is sometimes suggested that many young people are anxious to consume

now, and show little concern about consumption in the future. Such

preferences, taken in conjunction with capital market imperfections,
would result in fewer young people deciding to enter training programs.
In consequence of the smaller numbers, the lifetime income differential
between skilled and unskilled workers would persist, and might be large.
The flow of people into training programs would be insufficient to
eliminate the differential.

A continuing lifetime wage differential does not depend on
such differences in tastes. Even if all individuals had identical
tastes, capital market imperfections alone could lead to an equilibrium
of the kind derived above. That is, the inability to borrow against
future income could result in a sustained gap between the present value
of skilled and unskilled wage rates. The case is illustrated in Figure
5-5. The lower part of the figure reproduces the information from 5-4
and superimposes an indifference curve, labelled I, indicating combin-
ations of consumption levels in each of the two periods which yield a
given level of satisfaction to all individuals. Such an indifference
curve, with its usual convex shape, touches both CS' and CU'. Such a
situation could result in some choosing training and others not. Those
who remained unskilled would earn WU_1 in the first period and WU_2 in
the second, and would consume CU_1' in the first period and CU_2' in the
second. Those who trained would consume their full wages in each
period. Both groups would consider themselves equally well off, by
virtue of sharing a common indifference curve. This outcome would be
consistent with a continuing wage differential which the economic
agents, acting in their own interests, would have no incentive to
remove.

In practice, capital market imperfections may not operate quite so rigidly as the above example suggests. Some people are able to borrow from their parents or others, or are the recipients of gifts to finance their education. In such cases, the capital market imperfections are at least partly offset and, in effect, the situation represented in Figure 5-1 is more closely approximated. Of course, not all young people have access to such support, and for them the training option may be less attractive.

Capital market imperfections are not the only impediment to ideal training choices. Another is ignorance of the available opportunities -- a consideration which is probably quite important in practice. That is, even among those for whom possible training is a most relevant consideration, the information concerning various training options and some indication of the associated future job prospects may not be readily available. Word-of-mouth "information" from friends, relatives, and others, or a brief session with a high school councillor, many of whom have little specialized knowledge of labour market prospects and vocational alternatives, may, in the end, prove decisive influences on the choices actually made.

Another impediment is the inevitable uncertainty of employment and the associated level of income in the future, once a course of training has been completed. The greater the uncertainty associated with the future benefits, the less willing will individuals be to incur training costs now. Of course, the perception of future benefits is related to the overall economic environment: the more stable it is, the greater the certainty which one might attach to estimates of future benefits from present training.

4. GOVERNMENT INVOLVEMENT IN THE TRAINING PROCESS

The future is uncertain, capital markets are not likely ever to be perfect, and individuals will inevitably remain less than fully informed about the opportunities open to them. In such circumstances, what is a sensible role for government? How should government be involved in the training process, if at all?

Some suggestions for possible government involvement are implicit in the earlier discussion. The government might concern itself with (1) the availability of loans to meet training costs, (2) certain aspects of the tax system, and (3) the provision of better information. In addition, governments may, and in fact do, take measures which have a major bearing on the nature and extent of training facilities available. We consider each in turn.

It is obvious that, in practice, capital markets are far from perfect. In particular, it is generally difficult or impossible for individuals to borrow today against the prospect of high incomes in the future if that is the only security they have to offer. At the same time, those prospects are likely to be realized, on average. In such circumstances, there may be a good case for government to guarantee the loans which private financial institutions make to students, and thereby remove the risk to the lenders.[4] In fact, the Government of Ontario has gone far in this direction. Under the terms of the Ontario Student Assistance Plan (OSAP), eligible students can obtain government guaranteed loans, the repayment of which need not start until six months after eligibility ends. In fact, OSAP goes further than simply guaranteeing the loans: for eligible students the

interest charges are paid directly by the government, and thus represent a gift. To the extent that OSAP makes possible borrowing against future income, it extends the line CS' of Figures 5-4 and 5-5 towards the vertical axis. To the extent that it represents a gift, it moves CS' parallel and to the right. A system such as OSAP would appear to increase, perhaps substantially, the incentives of individuals to enrol in eligible programs.

The income tax system also affects the expected benefits from training. Referring again to Figure 5-1, a proportional income tax would simply move the CU and CS lines towards the origin in the same proportion. That is, the consumption options available to the individual would all be reduced by, say, 10 percent (or whatever the tax happened to be), regardless of the training decision.

In this sense the proportional tax is non-distorting: individual decisions regarding training will not be affected by such a tax. However, the situation is different if the tax is progressive rather than proportional. The CU schedule might then shift by, say, 10 percent, while the CS schedule shifted by 15 percent. The net result would be to reduce (perhaps considerably) the incentive to take training, since the tax itself would reduce the relative value of the expected benefits. One would expect fewer people to choose the training option.

A progressive tax combined with capital market imperfections could exacerbate the situation further. In Figure 5-5, let the CU' and CS' lines represent the after-tax consumption options which would be available. If I is the common indifference curve, the same equilibrium as before must prevail, though now in after-tax terms. Employers would

offer such a level of after-tax options only if there were fewer skilled and more unskilled workers, since in this case the (pre-tax) present value of skilled labour to the employer would be greater than PVS_a, and the corresponding value of unskilled labour would be less than PVU_b. By increasing the employer's relative cost of skilled labour, the progressive income tax will result in even fewer people taking training. Thus the progressive tax appears to introduce a distortion in factors affecting training choices. If the tax could be imposed on the present value of lifetime income rather than on each period's income, no such distortion would occur.[5]

Another aspect of the current tax legislation may be noted. Students are permitted to treat their tuition fees as a tax deduction; the fees can be deducted from current income in calculating income subject to tax. What often happens, of course, is that the fees are high when income is low, and the allowable deduction provides little benefit. The individual would be better off if the deduction were allowed during a period of high income: in terms of Figure 5-1, there would be a parallel outward shift in the CS curve, implying a greater incentive to undertake training. (Similarly, there would be a parallel shift in CS' of Figure 5-4.) There is, of course, an analogy with the capital investment made by a firm: a firm is permitted to deduct annually the depreciation charges associated with earlier expenditures. An individual might be allowed to spread his investment in human capital over a number of years so that the costs are associated with the resulting income. Alternatively, whoever pays the fee might have the option of treating it as a current tax deduction. The net result would again be to reduce the effective cost of training, and thereby encourage increased enrolment.

Finally, we have suggested that government could perform a useful function by improving the quality of information available to young people and others considering skill development. It would seem that much could be done to make more readily available information about the kinds of job vacancies which exist at present, the nature of training required to hold such jobs, the wage rates available to those with particular skills, the ways in which skills can be acquired, where they can be acquired, and the costs of doing so. Such information on a reasonably comprehensive basis seems not now to be generally available.[6] In the absence of appropriate labour market information, the effectiveness of government subsidies for education and training is impaired.

Going beyond the provision of information about current market conditions and the availability of training programs, the government is far better situated than the individual to assess the future demand for particular types of skills. Such information could be based in part on the forecasts of employers and in part on an independent assessment of labour market conditions. It could be made available to interested parties to make whatever use they felt appropriate in reaching their training decisions. By providing accurate and timely information the government might reduce considerably the uncertainty associated with possible decisions which individuals might make now. Better informed actions will result in less wastage of scare training resources.

Well designed programs to reduce the impact of capital market imperfections on training choices, to reduce the impact of distortions associated with the tax system, and to make available the best possible information about the employment and income prospects for various

occupations could be put in place at relatively low cost. Such programs would undoubtedly be of assistance to individuals in making informed decisions about the sorts of jobs for which they might prepare themselves.[7]

Up to this point our discussion has ignored the government as the pre-eminent supplier of training programs. Its role as supplier, whether defined broadly or narrowly, is clearly important in Ontario. On the broader basis, the Government of Ontario, through its Ministry of Education and the local school boards, determines the courses of study which are available from kindergarten through grade 13, and influences, through its counselling activities, the flows of individuals into various vocational and technically oriented courses on the one hand, and more academically oriented courses on the other. Furthermore, through its Ministry of Colleges and Universities it decides how much money will be allocated to various postsecondary institutions, and on what basis. While much funding may be based strictly on student enrolment, other funds are associated with particular offerings. For example, higher per student funding is provided for various professional schools, such as medicine, law, engineering, and dentistry. Only designated universities receive such funds. If the provincial government should conclude that additional facilities are required it might encourage the expansion of existing offerings or the development of new ones. Similarly, there are designated programs at the community colleges which are quite specialized in nature, and which are offered in only a few colleges, following an assessment of the demand for persons graduating from these programs. Occupational therapy programs are one example and teacher-training programs are another. To take the second example, it is a matter of policy to determine how many places there will be at the teachers' colleges each year.

On the narrower basis, the Government of Ontario sells the services of certain training facilities to the Government of Canada in connection with the Canada Manpower Training Program, as noted in Chapter 3. Such facilities are normally located in community colleges. The revenues which flow to the community colleges in this connection form a large fraction of their total revenue -- more than 21 percent in both 1978-79 and 1979-80.[8] While the federal government pays, the two levels of government together determine the number of individuals for whom funding will be provided for each kind of training program.

The point, then, is that, in one way or another, the federal and provincial governments jointly have a major impact on the availability within the province of a broad range of training programs, and on the costs to individuals who enrol in them. The prominent role played by government presumably serves also to discourage the development of private training institutions, since they must charge the full costs of providing their services if they are to remain in business, and they always run the risk of being displaced by publicly subsidized training as a result of a change in government policy.

Since government has, in effect, assumed a dominant role in the training field it is imperative that its programs be well designed, timely, and generally suited to the needs of the community they are intended to serve. In this connection, we mention again the training levy scheme discussed in the previous chapter. Under the proposed terms of this scheme, control of the purse strings by industry would give it a much stronger voice in determining the offerings and

influencing the content of vocationally oriented programs. Educational

institutions would become more responsive to the legitimate demands of

industry, and less insulated from such demands by the cushion of
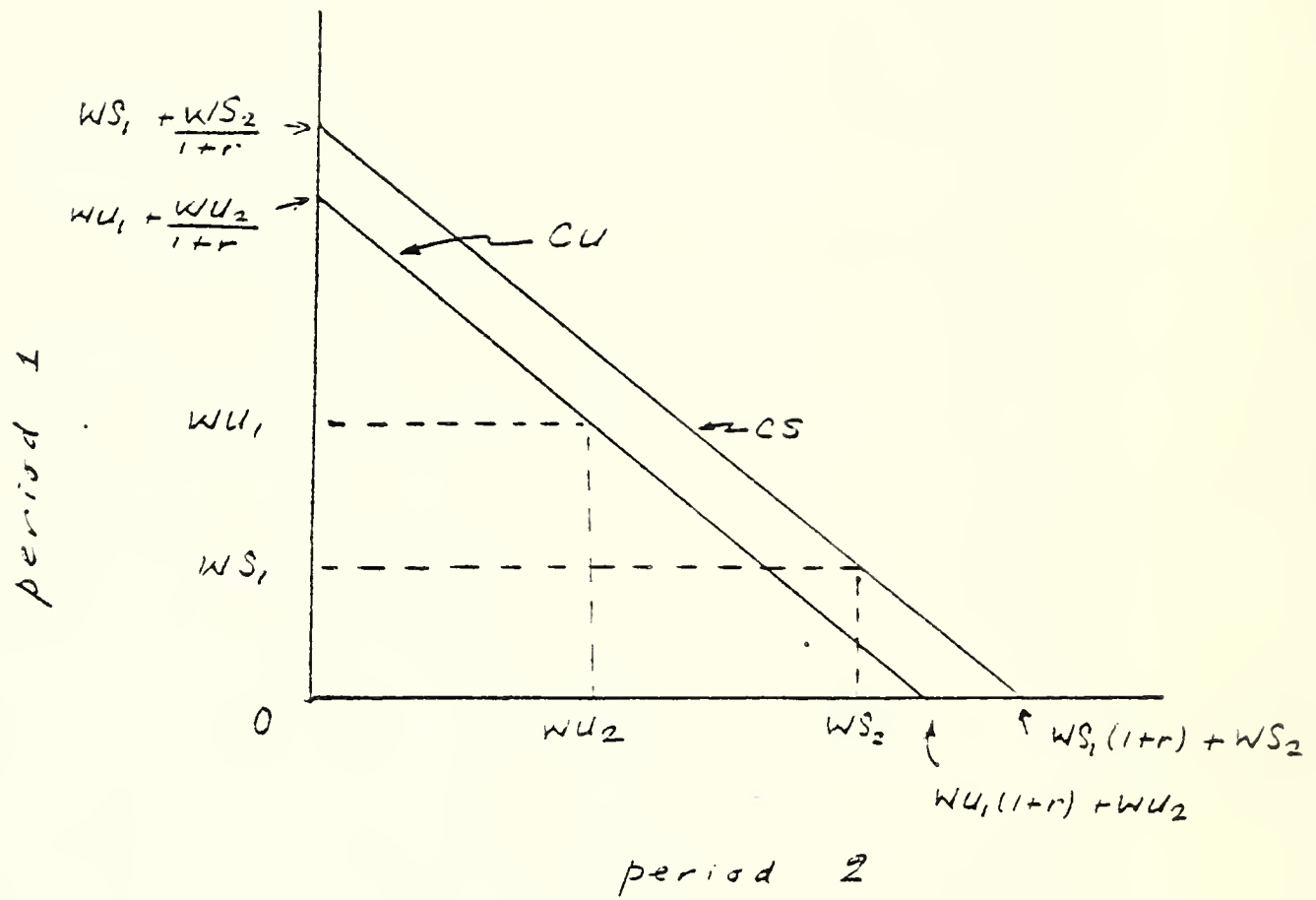
government funding.
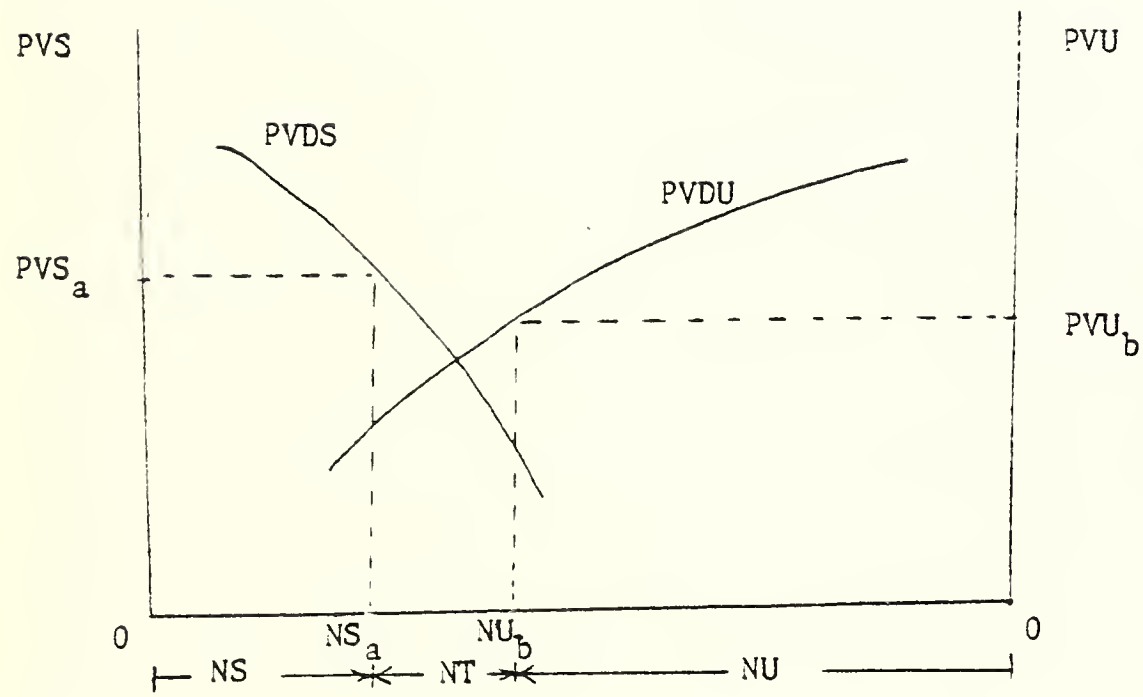
Figure 5-1: Wage Income and Consumption Possibilities

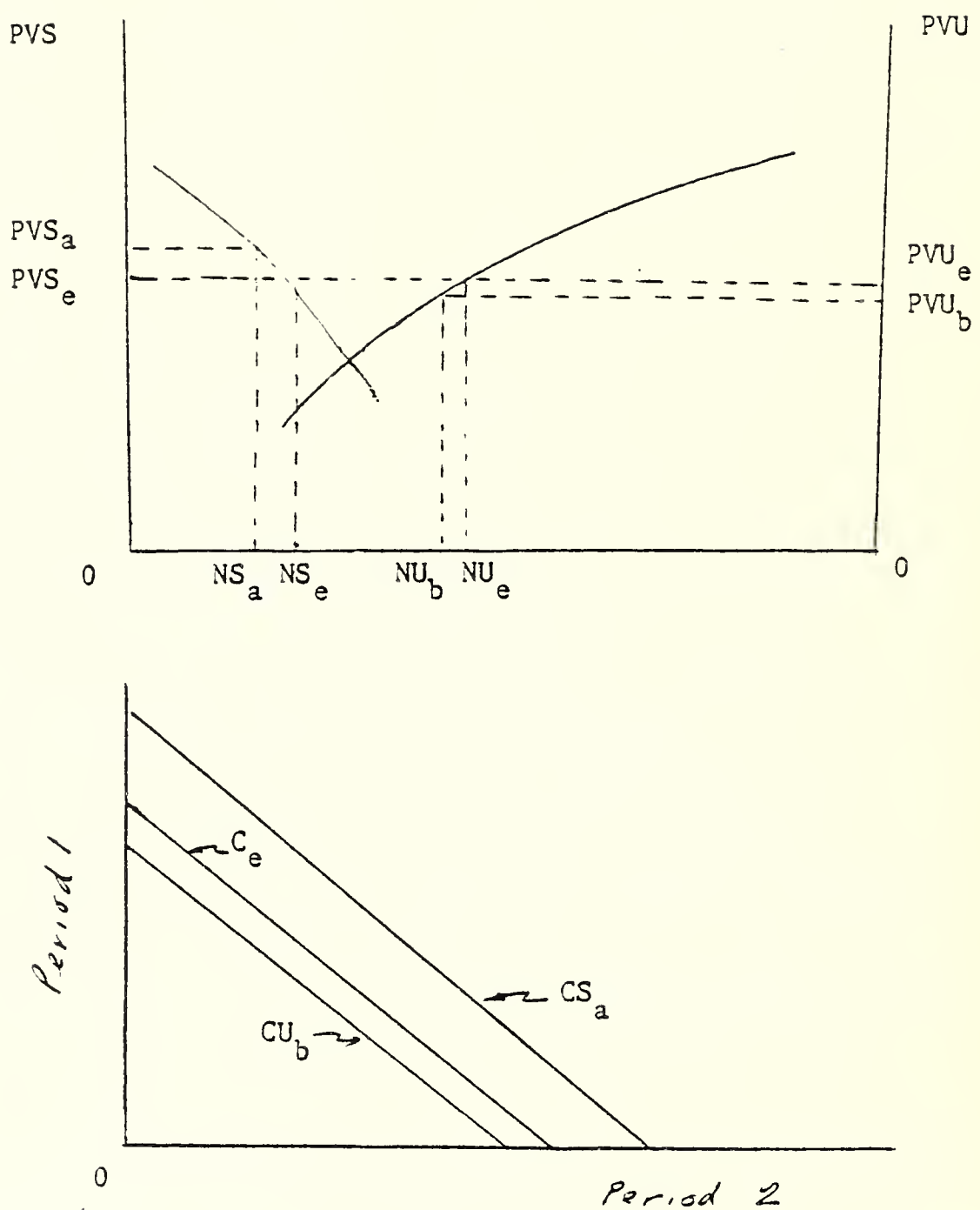Figure 5-2: Present-Value Demand Curves with a Fixed Labour Supply

Figure 5-3: Adjustments in the Overall Labour Market
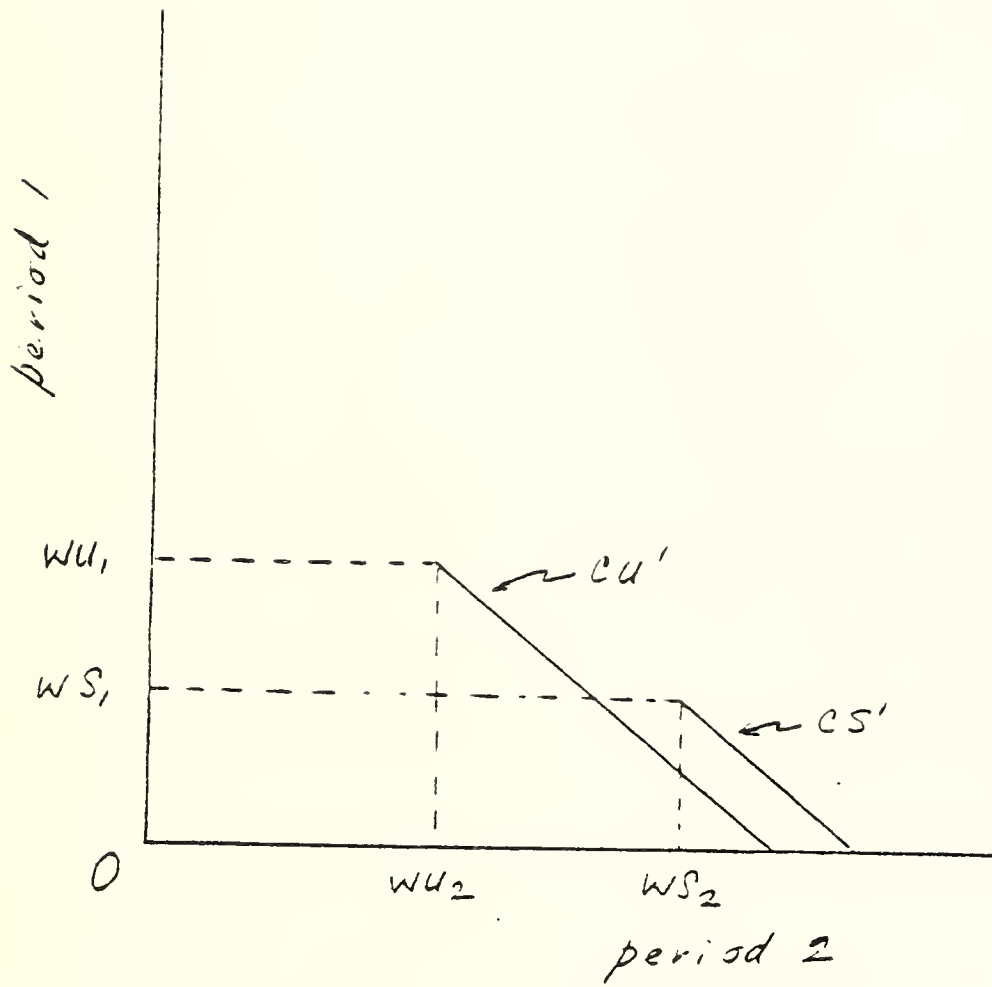(upper diagram) and in the Opportunities
of Individuals (lower diagram)

Figure 5-4: Wage Income and Consumption Possibilities
with Capital Market Imperfections
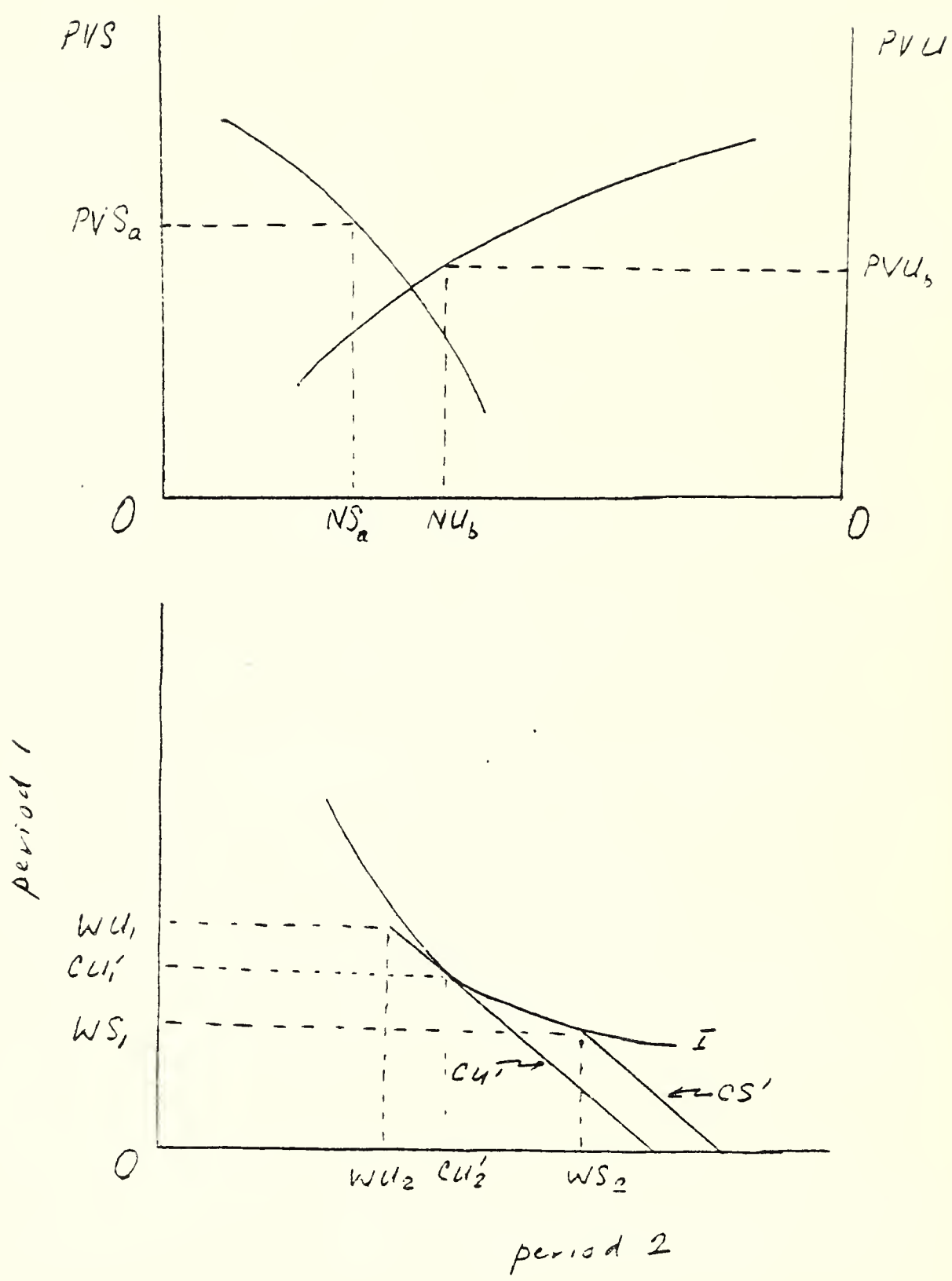
Figure 5-5:   The Overall Labour Market (upper diagram) and Individual
              Maximizing Decisions (lower diagram) with Imperfect
              Capital Markets

FOOTNOTES TO CHAPTER 5

1. The original development of the lifecycle theory of consumer behaviour is due to Modigliani and Brumberg (1954). For a recent bibliography of lifecycle theory and applications, see Mann (1981).

2. Some studies concerned with the impact of less-than-ideal environments on the formation of human capital are Becker (1962,1974), Weiss (1972), Levhari and Weiss (1974), and Holtmann and Smith (1977).

3. There are many reasons why one might experience such difficulties, not the least of which is the uncertainty associated with one's future income, a fact which might impress prospective lenders more than borrowers. Also, even if student borrowers do have high incomes in the future the prospective date of loan repayments may be far off, by which time the accumulated debt may be considerable and, with human capital as the only collateral, the borrower may be hard to find.

4. While governments can average out individual risks of default associated with future earnings prospects, there will still be borrowers who will take steps to avoid repayment of their debts; see footnote 3.

5. In passing, we note that the income averaging provisions in the Income Tax Act go some little distance towards taxing income on the basis of periods longer than one year, but fall far short of basing tax payment on one's lifetime income stream. Needless to say, there would be many practical difficulties associated with any attempt to introduce the concept of a lifetime tax base. Eaton and Rosen (1980) analyse the effect of taxation on human capital accumulation under conditions of both certainty and uncertainty of the future income stream.

6. Support for this assertion is provided by the report of the Task Force on Labour Market Development (1981). Citing recent studies by Professor David Stager and others, the Task Force concludes that "There can be little doubt of the importance of improved career information and counselling. Several studies ... have found that high school and post-secondary students derive relatively little career information from formal guidance services." (p.80). In a more general context, the Task Force concludes that "Availability of better labour market information and intelligence will improve the operation of labour markets. To be effective, however, this information must be widely disseminated. Schools and colleges must have access to the information for guidance purposes; firms must have access to it for strategic and manpower planning; and workers must have access to it in order to make better choices in the labour market." (p.202).

7. Among other relevant studies and comments concerned with government's role, see Sterling Institute (1971), Kerton (1973), Everett (1976), Collyer (1980), Rygus (1980), Newton, Betcherman, and Meltz (1981), and Denton (1981).

8. This percentage is based on figures supplied by the Ontario Ministry of Colleges and Universities.

CHAPTER 6

MANPOWER POLICY AND THE MACROECONOMY

1. INTRODUCTION

The objective of manpower policy, as defined for our present purposes, is to affect the stock of labour resources in some desired way. If the concern is with a general shortage of labour, the policy may be to increase the size of the labour force; if it is with shortages of skilled workers, the policy may be to train people in particular skills, or perhaps to raise the average skill level over a broad spectrum. In any event, the fundamental motive is to influence the stock of labour so as to allow the economy to generate more output, higher levels of income, and hence more consumption, more investment, and so on. Thus manpower policy should be expected to have widespread consequences for the macro-economy. The purpose of this chapter is to discuss these consequences.

As we have noted, the two major instruments of public policy for influencing the supply and quality of labour services available to the economy are training and immigration. These are not the only instruments. For example, subsidization of day-care facilities would encourage women with children to return to the labour force in greater numbers and incentives for labour force participation that could be provided through the income tax system are not difficult to think of. However, training and immigration are the main instruments and we shall focus on them.

The two instruments may be regarded as alternatives in some circumstances, but their implications for the economy are quite different.

Manpower training may be thought of as a means of "deepening" human
capital: the total labour force remains the same but its quality or skill
level is raised.   Immigration, on the other hand, may both "deepen" and
"broaden": if immigrants have the same skill composition as the existing
labour force, the stock of human capital is merely "broadened" -- in-
creased by virtue of adding more people; if the skill level of immigrants
is higher, the average quality of the stock is increased at the same time
as its size.

· Training and immigration differ in another important respect.
In the case of training, the size of the population is not altered, merely
its labour skills. To the extent that a higher level of national income
results, the increase is spread over the same population as before. But
immigration increases both the supply of labour services and the number
of earners and consumers. The increase in national income is now spread
over a larger population, and whether per capita income will be raised
is not immediately obvious.

We shall analyse the effects of training and immigration under
separate headings below. First, though, there is a prior and quite
fundamental issue to be addressed. This is the issue of substitution
among factors of production -- between different types of labour and
between physical capital and human capital. Manpower policy of the kind
in which we are interested may be oriented largely towards dealing with
perceived labour shortages, either in total or in particular occupations.
But to make sense of the notion of a labour shortage one must first ask
to what extent employers might be able to circumvent the shortage by

changing their methods of production. Are they "locked in" to particular ways of doing things or is there scope for changing their ways so as to reduce the use of the scarce labour and make greater use of more abundant factors of production? And if there is such scope, what are the incentives for actually making a change? In the jargon of economic theory, what does the aggregate production function look like?

2. TWO VIEWS OF THE PRODUCTION PROCESS

Economic theory offers two quite different models of production. One assumes that inputs must be combined in proportions determined by a fixed technology; the other assumes that the proportions may be varied in response to changing price ratios and the incentive of cost minimization. The fixed-technology model is associated with the name of Wassily Leontief, the pioneer of input-output analysis. The model permitting substitution of one input for another may be referred to as the neoclassical model. Both models are widely used in economic analysis, in one form or another, and each is appropriate in particular circumstances. The important consideration for our purposes is that they have markedly different implications for the concept of a "labour shortage".[1]

The neoclassical model allows producers to make a given product with many different combinations of inputs. If the availability of one input is reduced, its price will rise relative to the prices of others, and producers will use less of it and more of the other inputs. If the supply of a particular type of skilled labour declines, competition in the labour market will drive up the wage rate for such labour and producers

will find ways of substituting other types of labour, or perhaps of using more automated processes requiring more equipment but fewer skilled workers. With prices and wages free to vary, the final outcome of this process will be a situation in which demand and supply are in balance for all types of labour and other inputs, and all available resources are fully employed. So goes the theory.

The point of the foregoing is that neoclassical production theory leaves no scope for a meaningful definition of a "labour shortage," and this is true whether we are talking about a particular type of labour or about labour as a whole. Any tendency for the supply of labour to fall short of the demand will set in motion changes in wage rates which will restore the balance by inducing reductions of the demand, increases in the supply, or both. We must look to some other body of theory to support the notion of a labour shortage -- and, of course, the appropriateness of manpower policy intended to deal with such a shortage.

The fixed-technology model provides some support. In its pure form, this model assumes that to produce a given amount of some product requires fixed numbers of hours of labour of different types, fixed numbers of machines of different types, fixed amounts of raw materials, and so on. There is no flexibility -- no possibility of substituting a more abundant input for a scarce one. If the supply of one factor of production does not increase as rapidly as the supplies of others it acts as a restraining force, preventing the full utilization of the other factors. If the restricting factor is skilled labour, unemployment of unskilled labour and underutilization of capital equipment develop.

Skilled labour acts as a bottleneck which inhibits expansion, and the productive capabilities of other inputs go unrealized. Under the assumptions of this model there is no ambiguity at all in the use of the word "shortage"; it is quite appropriate to speak of a shortage of skilled labour in the example just given. Any shortfall of one productive resource below the level required for the full employment of other resources may be so termed.

It is natural for a producer to think in terms of fixed ways of making his product. His plant is designed on the basis of particular production methods. If he encounters difficulty in hiring workers with the skills that his plant requires he will view this as evidence of shortage. An important question to ask is what will happen if the shortage persists: will the producer, or industry as a whole, be forced to curtail production, or will new ways of producing evolve in such a way as to bypass the problem? History suggests very strongly, one would think, that the latter is likely to be the case, given enough time. Necessity is the mother of invention -- or, more correctly, the profit motive provides the incentive to adapt to changing circumstances. In the short run, the fixed-technology model may be the appropriate one; in the longer run, though, the neoclassical model may more nearly reflect the behaviour of the economy. Given enough time, market forces will engender changes in wages and prices and the economy will respond by adapting its methods of production to the human and other resources available.[2] In contemplating the prospect of a labour shortage and the issue of adaptability, the important considerations are the length of time available for adjustments and the extent to which the shortage is foreseen, and hence allowed for in planning.

The foregoing is a simplification, of course. Production processes are more adaptable in some industries than in others, and in some there are particular types of skills that are critical, and not replaceable. But if one is painting with a broad brush, as is our intention here, one has to view the economy's processes of production, in the aggregate, as quite adaptable. Wages and prices do adjust, substitutions among inputs do occur, entrepreneurs do adapt to changing circumstances, and new technology does evolve under the stimulus of profit seeking. All of this might be regarded as rather obvious, and emphasis on it unnecessary, were it not for the fact that much public debate about manpower policy and planning seems to ignore it. The implicit assumption often seems to be that there is rather little adaptability, much historical evidence to the contrary notwithstanding.[3]

Our argument, then, is that the nature and adaptability of production processes are important and undervalued considerations if one is attempting to evaluate manpower policies designed to alleviate labour shortages. Such policies may or may not be deemed appropriate. But regardless of that, there remains the question of whether policies aimed simply at deepening or broadening the society's human capital are desirable. Even in a purely neoclassical world, with continuous full employment of all resources, it may still be desirable to invest in human capital, just as it may be desirable to invest in physical capital. We shall consider this question in some detail.

3. THE MACROECONOMIC EFFECTS OF TRAINING

The stock of human capital is continuously changing. Young people enter the labour force, bringing with them the capital acquired in schools,

colleges, and universities. Older people retire and people in between move in and out of the labour force for lesser or greater periods, depending on personal circumstances and general economic conditions. Mortality takes its toll at all ages, and migrants come and go. These are all flows of people. In addition, there are the "flows" which do not involve movements of population, but rather changes of skills by those already in the labour force. The increase in skill levels through manpower training is such a "flow." So too are the additions to skills that come simply with experience -- "learning-by-doing" effects, as they have been called. One the other side of the ledger are losses of skills through disuse and through aging and illness, and the obsolescence of skills that have been bypassed by changing technology.

The stock of human capital may thus be thought of in much the same way as the stock of physical capital. It is augmented each year by new investment and diminished by "depreciation." Members of the labour force may leave and re-enter, just as machines may be shut down and then returned to production. The analogy is certainly not perfect, but it is good enough to be helpful in thinking about issues relating to manpower as a productive resource. It is good enough also to provide a justification for the use of the term "human capital" and a basis for the economic theory that has come to be associated with that term.

Training is investment in human capital. The implication of that statement is that training involves the sacrifice of present consumption of national product in the expectation of higher levels of consumption in the future. Resources are diverted from the production of goods for consumption today to the production of skills that will

enlarge the productive capacity of the economy tomorrow. The correspond-
ence with investment in physical assets is, of course, a close one: in
the latter case, present consumption is foregone so that the economy may
provide more machines, buildings, bridges, and so on for the provision
of future benefits.

Training requires the use of real resources. That statement
follows immediately from what we have just said. First, if the trainees
would otherwise be productively employed, the time that they spend re-
ceiving instruction represents a withdrawal of labour services from
general production; the labour force is therefore effectively reduced,
and some amount of present output is foregone. Secondly, the training
activity requires instructors, administrative staff, and other personnel,
and they too represent services that potentially could be available for
other productive activities. Thirdly, the training activity requires
physical capital in the form of buildings and equipment, thus reducing
the stock of such capital available for other uses.

There are three responses that one might be tempted to make to
these assertions. The first is that, in fact, training activities are
sufficiently minor, in terms of numbers of manyears away from production
or other measures, that their costs in terms of present output foregone
must be relatively small. To the extent that that is true, though, the
amount of investment in skill development is correspondingly small, and
so too are the increases in output that one should expect for the future.
The argument that for every unit of future benefit there is a present cost
is still valid, even if the actual number of units involved is not large.

The second response is that a substantial proportion of training
occurs "on the job." Apprentices take classroom instruction but spend

much of their time learning their trade by working at it, under super-
vision. Others simply learn to do new jobs informally, improving their
abilities week by week as they do their work. Are these not examples of
having the cake and eating it too -- of both developing skills and con-
tributing to current production at the same time? Such persons do, of
course, both learn and produce over the course of a year. Nevertheless,
the principle that training involves costs still holds. The apprentice
is not producing while he is in the classroom, however much benefit he
may be getting from the point of view of his future productivity. The
informal "on-the-job" learner is both developing skills and producing,
but that would take place in any event. "Learning by doing" is an aspect
of everyday life, whether in the factory, the office, or elsewhere. It
is unquestionably important, but there is little sense in including it
under the heading of "manpower training programs" since it is not
"programmed", by any useful definition of that word.

The third response is that trainees may be drawn from the
unemployed, and therefore not represent a withdrawal of labour services
from production. This is an important question because, in practice,
a large fraction of trainees under the Canada Manpower Training Program
are reported as having been unemployed prior to training. In fact,
there are several reasons for thinking that there may still be a reduction
of productive labour services or that the benefits -- the future increases
in productivity -- may be lower, on average, for unemployed persons who
enter training programs. But the question is sufficiently important
that we shall consider it in some detail below, in Section 5 of this
chapter.

If training is effective and the average productivity of the
labour force therefore increases, there will be a corresponding increase
in the total national income that the economy can generate. The question
of who gets the increase in national income then arises. The neoclassical
theory of income distribution argues that it will accrue to the trainees
(at least if their skills are of a general or transferable nature). It
is their productivity that has increased, and the theory says that
competition among employers will ensure that the wages of the newly
skilled workers will rise to the point at which their remuneration just
equals the increased values of their marginal products. That, of course,
is an oversimplification. It is most unlikely that all of the assumptions
of the neoclassical theory will be satisfied in the real world.
Competition may be imperfect: labour markets and other markets may
not operate in the purely competitive form that the theory requires.
And there may be "externalities": the existence of new skills in some
workers may allow other workers to be more productive, or it may allow
the use of more productive technologies which otherwise could not be
employed. There are many reasons why the neoclassical theory may not
be strictly applicable. Nevertheless, it provides a good starting
point for thinking about the question of the effects of training on
income distribution.

Who bears the costs of training? That is a critical question.
If the training "industry" involved only private firms, rather than
government agencies, and if there were no subsidization out of public
funds, then training would be bought and sold in the market like any other
market good. The individual wishing to increase his human capital would
pay a fee determined by supply and demand conditions and would bear the

implicit cost of foregone earnings and any other costs. The supply and demand would be brought into balance through the usual market mechanism of price adjustments. With government involvement, though, the situation is quite different.

The involvement of governments in skill-development activities may take a variety of forms, ranging from direct provision of training to the payment of subsidies or grants to private firms which provide training. It is conceivable that there could be an arrangement for recovering the government's costs in full by charging appropriate fees or by a system of interest-bearing loans. However, that would be unusual. The common practice is to meet some or all of the costs out of general revenue, and that implies a shifting of the costs to others in the society through the public revenue-expenditure system. In assessing the macroeconomic effects of a public training program it is therefore not enough to look only at the benefits resulting from the increase in human capital: one must look at the losses of current production, as we have argued, but also at the effects on government budgets, and hence on the economy at large as a result of changes in taxes, government expenditures, or the public debt.

Let us work through an example. Assume that a new public training program is to be introduced. Training allowances are to be paid to those enrolling and there must be provision for paying the salaries of instructors, the costs of space rental, the costs of equipment purchases, the salaries of administrative staff, and so on. Assuming no provision for direct cost recovery, this total may be financed in one of three ways: by increasing taxes, by reducing expenditures in some other category, or by resort to borrowing. If

general taxes are raised, the costs are shifted to the public at large,
and there may then be additional effects through reductions of private
consumption, savings, and investment. If instead there is a compensating
reduction in some other form of government expenditure, one wants to
know what services are being curtailed, who suffers as a consequence,
what effects this will have on private expenditure patterns, what
secondary repercussions these may set in train, and so on. Finally,
if the new costs are met by borrowing, the government's budgetary
deficit increases and the public debt rises. The servicing and repay-
ment of the new debt then become a charge on taxpayers in subsequent
years, and the present costs of training have been shifted into the
future. (In addition, of course, the increased deficit may have short-
run implications for investment levels, prices, and so on.) In short,
the training program may yield benefits which accrue to the trainees,
as well as to others in some measure; but it also implies costs, and
who ultimately pays these costs is determined by the manner in which
the program is financed. The actual reckoning of the costs and their
distribution is a complicated matter, but the existence of the costs is not
in question.

4. THE MACROECONOMIC EFFECTS OF IMMIGRATION

Immigration represents the major alternative to training as an
instrument of manpower policy. If effective controls can be placed on
the numbers of immigrants, the flow can be increased or decreased, and
with it the rate of growth of the labour force. Selective controls or
incentives can be used to increase the numbers of skilled immigrants

generally, or of immigrants with particular skills deemed to be in short supply. Immigration is the "buy" option in the "make or buy" decision in dealing with manpower shortages.

Immigration policy and manpower policy are closely linked, both in practice and in public debate. However, immigrants do not represent additions to the working population alone, but rather to the population as a whole. Immigration has a high labour force content but it includes also children and other dependents. Whether in the labour force or not, every immigrant represents an additional consumer and a source of additional demand for the economy's product. Immigration affects every aspect of the macroeconomy, to say nothing of the social effects. It is therefore quite inappropriate to consider immigration exclusively from the point of view of its contribution to the supply of labour, although very often this is the way in which it is viewed.

If the labour force increases as a result of immigration, the economy's productive capacity will thereby be expanded, and there may be an increase in the aggregate income level, as recorded in the national accounts. But will per capita income rise? That question has been the subject of much debate.

The nature of production processes is important in addressing the question. In the world of neoclassical theory, with constant returns to scale in production, substitution possible among inputs, perfectly competitive markets, and full employment, all factors of production will receive their marginal products. The wage rate of an immigrant worker will thus be equal to the value of the additional product that he generates. The effect of immigration on per capita income over the population as a whole (including the new immigrants) will then depend on the availability

of other factors of production. If natural resources are limited, <u>per capita</u> output, and hence income, will drop: the aggregate economic pie will be larger but the individual slices will be smaller, on average. This is pure theory, of course, and one can very quickly think of many ways in which the real world does not accord with the assumptions. Nevertheless, the theory is suggestive. It provides one line of argument for questioning whether manpower policy based on immigration controls will, in fact, make the economy better off, if <u>per capita</u> measures are the criteria.

A quite different picture emerges if one adopts the fixed-technology model of production. Now the importation of labour may indeed raise <u>per capita</u> income. In the fixed-technology model, there may well be shortages of labour, in a meaningful sense of the word "shortages." The total labour force may be in short supply relative to the supply of natural resources, for example, and resource development may be impeded. Alternatively, there may be shortages of workers with some particular skills which prevent the full employment of other workers. The importation of labour may break the "bottlenecks," allow the employment of underutilized human or physical resources, and increase production and income, both in the aggregate and <u>per capita</u>.

How one views the processes of production is thus seen to be critical. As we argued in section 2 of this chapter, the extent to which producers can substitute among different types of labour or other inputs, adapt their production methods, and draw on new technology is a fundamental consideration. As we argued also, the issue has an important time dimension: adjustments that are impossible in the short run may be quite feasible in the long run. The question then is how short is "short" and how long is "long."

Immigration, like training, affects the stock of human capital and its effects are transmitted far into the future. A person who immigrates at the age of 25 may be a member of the labour force for the next four decades. But his children will also join the labour force when they come of age, and then his children's children. The labour force of today, and the population generally, reflect the long-run consequences of the policies of previous decades. Every event no doubt has some influence on the future, no matter how small. But the difference between the effects of training and the effects of immigration are of a large order. The addition to human capital that results from skill training is lost when the trainee retires from the labour force but the increase that results from immigration may persist indefinitely.

The foregoing is rather obvious, and not worth emphasizing were it not for the fact that it seems often to be overlooked. Much public discussion of immigration policy seems to be concerned almost entirely with short-run effects. It is hard to avoid the conclusion that policy and policy discussion are often too narrowly focussed on two counts: first, by considering labour-market effects to the exclusion of other economic and social effects; and secondly, by failing to look much beyond the near-term future, and thus failing to consider what may be the very important long-term economic, demographic, and social consequences of policies adopted today.

The use of immigration as an instrument of policy implies that a government is able to control -- or at least influence -- the annual numbers of people coming into its jurisdiction and their composition in terms of employment skills. If there are large numbers of people with the desired characteristics who want to enter the country, it is just a

matter of the national government turning the tap on or off, as required.
This was generally the situation in Canada for many years after World
War II but it is much less true of the present. The incentives to migrate
to Canada, especially for skilled or professional workers, are much
weaker, and the instrument is thus a much less potent one. Moreover,
a provincial government generally has very little control over its
immigration, which includes flows both from outside Canada and from other
areas of the country. Recruitment programs and advertising campaigns
are possibilities, but these fall far short of the regulatory powers of
the Canadian immigration authorities. The Canadian government may
exert some influence on the initial destinations of immigrants from
abroad, but once the immigrants are in Canada there is little to prevent
them from relocating. Policies of preferential treatment in the hiring
of residents by provincial governments may have some effect on movements
within the country, but this is likely to be small. The language
policies of the Quebec government are no doubt effective in restricting
immigration into that province, but the scope for increasing it, either
generally or in specific skill areas, is probably as limited there as
elsewhere. In short, Canadian immigration is subject to control for
purposes of manpower policy, but in much lesser degree than in earlier
decades, and intranational migration is subject to very little control
for such purposes. In talking about the use of immigration controls for
purposes of manpower policy, we are talking largely about a federal
instrument.[4]

5. MORE ON COSTS AND BENEFITS

The issue of costs and benefits warrants some further attention. The costs of training are the output, income, and consumption foregone because trainees are not engaged in production and because the training activity requires the use of instructors, equipment, buildings, and other real resources which could have been employed for other purposes. The benefits of training are the higher future levels of output, income, and consumption that result from the investment in human capital, and possibly from the employment of other resources that hitherto were unemployed because of an inadequate supply of skilled workers. In the case of immigration, the benefits are associated with the higher levels of output that ensue from the increase in the labour force while the "costs" are the incomes and consumption of the immigrants -- the claims that they have on the national product in return for the provision of their labour services. As with all investment, the costs of training are felt immediately while the benefits come later. In the case of immigration, though, there are immediate effects on both sides of the accounts.

We raised earlier the question of how the cost-benefit calculus is affected if trainees are drawn from the unemployed and we noted that this is an important question, inasmuch as a large fraction of persons entering the Canada Manpower Training Program are, in fact, recorded as unemployed prior to entry. One can envisage a hypothetical system in which a fraction of the labour force becomes unemployed each month, and this fraction is immediately channeled into training programs. One might argue that the opportunity cost of the programs would then be greatly reduced, from a social point of view: training would still require the use of instructors and other real resources, but the trainees would not

have been employed in any event, and hence no production would have been lost on their account. There may be an element of truth in this, but the argument is simplistic. There are two important considerations which it ignores.

The first consideration is that matching jobs and workers involves search time. A person who loses a job may search for several weeks before finding another one. If he is drawn into a training program, his period of search may simply have been postponed: when he emerges from the program he still must find a job. His potential output is then lost while he is in training as well as while he is searching. Of course, if training qualifies him for an occupation in which there is a greater demand than in his old occupation, the period of search may be reduced. However, it would generally be incorrect to argue that, on average, people find jobs immediately after training, that search time is therefore simply substituted for unemployed time, and hence that there is no cost in terms of foregone output. The cost may or may not be reduced. Whether it is, or by how much, is uncertain.[5]

A second consideration is that the process that generates unemployment in the labour market may be an inefficient process for selecting trainees. There is no guarantee that persons without jobs are the most suitable ones from the point of view of acquiring new skills. That depends very much on the reasons for their unemployment. If they are out of work because their existing skills have become redundant in some sense, then it may be efficient and appropriate to retrain them. However, if they are turned out of their jobs for other reasons, it may well be that they are not the most suitable members of the labour force to receive training. There is the danger that unemployed persons may look on a training program as a form of unemployment compensation, rather than as a means of improving skills. A high rate of drop-out before

completion of training would be an indication of this. (That drop-out

rates from the CMTP are, in fact, substantial was noted in Chapter 3.)[6]

In analysing the long-term effects of training one assumes that

it is, in fact, a form of investment which yields future returns to the

society through increased productivity. But that assumption is not

necessarily valid. If a training program is ill-conceived or ineffective

in its application, there may be no increase in future product. The costs

are incurred but the benefits are not realized. In effect, the program

may then amount to a transfer process: income may be collected through

taxes and transferred to trainees in the form of allowances or subsidies

in much the same way that tax income is transferred in the form of family

allowances, old age security payments, and so on. In some cases this may

in fact be the aim -- to use a training program as a device to reduce

unemployment and transfer income, rather than to generate long-term increases

in human capital and productivity levels. In others, there may be long-term

goals but the programs may be ineffective, so that the result is the same.

No doubt the history of manpower training includes many instances of programs

that were ill-suited to the realities of the market place, and which amounted

therefore to "make-work" programs, with little or no lasting benefits.

A basic problem in the planning of manpower training is to

anticipate future demand. As with other forms of investment, there may

be long lead times -- long periods between the planning of a program and

the issue of graduates from it. It is important therefore that future

labour demand be foreseen and this, of course, is a very difficult

business. To the extent that the anticipation of demand is incorrect,

the program may turn out to be inappropriate and the expected benefit-cost

ratio may not be realized. Issues of information availability and forecast

reliability are thus critical ones from the point of view of manpower training.[7]

6.   A SUMMARY

Let us summarize the argument of this chapter. Training and immigration are often viewed as alternative instruments of manpower policy. Each has widespread effects throughout the macroeconomy. However, their effects may be quite different. Training deepens the society's stock of human capital; immigration broadens it -- increases the number of people in the labour force -- although it may deepen it too, depending on the skills of the immigrants. Both training and immigration have long-lasting effects: a person trained at twenty-five may not retire for four decades; a person who immigrates at the same age may also belong to the labour force for forty years, and the effects of his immigration may be felt far beyond that by virtue of his progeny. Manpower policies are often designed from a short-run perspective, with little attention to their long-term implications.

The view that is taken of production processes is critical in assessing manpower policies and programs. We have noted the basic distinction between the fixed-technology model of production and the neoclassical model. In the first, output must be produced with certain combinations of labour and physical inputs. In the second, substitution among inputs is possible, and if one input is in reduced supply, others may be used in its stead. Manpower policy is often intended to deal with labour "shortages" but the notion of a shortage cannot be sustained in the neoclassical model; it requires the assumption of fixity in technology. We have argued that both models are useful and that their relevance to manpower planning is related to the periods of time involved: over a

short period, the fixed-technology model may be appropriate; over a longer period, the appropriate one may be the neoclassical model. History attests to the adaptability and evolutionary nature of technology, although that may be little consolation to the producer who has built his plant to employroduce a certain number of skilled workers and is unable to hire them in any given week. If adaptability is a characteristic of the long run but lacking in the short run, the important practical question then is how long is long and how short is short. We have argued that, in fact, much of the discussion of manpower policy is based implicitly on the fixed-technology model, and that even the term manpower "requirements," which is used so often in the context of manpower planning, reflects this model.

The effects of both training and immigration are felt far beyond the labour market, although that is their intended point of impact. A training program requires the use of real resources and the costs of these must be met. Unless trainees bear the full cost, this has implications for the government budget, and hence for the economy at large. Taxes may be raised, other expenditures cut, or the program financed by borrowing. In any event, there are implications for the distribution of income, for consumption levels, for investment, and so on. The question of who actually pays and who actually benefits after all of these effects have been sorted out is an important one but a difficult one to answer.

Immigration increases the size of the labour force but it also increases the population, and hence the number of consumers. The national product may increase as a result of immigration, but it is not certain that per capita income will be higher than it would have been. Immigration policy

and manpower policy have often been closely linked, and the effects that immigration has on the general economy and the society have not always been given their due recognition. In short, immigration policy has been heavily influenced by current labour market conditions rather than long-term economic and social considerations.

Training may be viewed as investment in human capital. The benefits of training are then the return on this capital through greater productivity and perhaps -- if one adopts something akin to the fixed-technology model -- through the employment of complementary resources that otherwise would have been underutilized. On the other side of the ledger, the costs are the current national product foregone because the trainees are not engaged in production and because their training requires the use of resources which could have been otherwise employed. Whether the benefits exceed the costs depends on many considerations, including the effectiveness and relevance of the training provided and the efficiency of the program. The anticipation of future labour market conditions is important if the benefts are to be realized. An ill-conceived program may simply be equivalent to a make-work project which transfers income but results in no yield-bearing investment. Drawing trainees from the unemployed may reduce the costs in terms of current production foregone but the effects are not necessarily in the desired direction: persons trained must still find jobs, and the search period may simply have been postponed, rather than replaced by the training period. Moreover, the unemployed may not be the most trainable members of the labour force: the processes that generate unemployment are not necessarily the best selection processes for a training program.

The economic benefits of immigration are the increases in national output and income. But looked at from the perspective of the existing population, there are economic costs. The immigrants are also income earners and consumers, and thus claim their share of the national product. As we have said, the net effect, as measured by the change in per capita income or consumption, is uncertain.

FOOTNOTES TO CHAPTER 6

1. The concept of a "labour shortage" is rather ill-defined and capable
of alternative definitions. The term is used sometimes to connote a
situation of "general excess demand" for labour, sometimes to indicate
specific excess demands associated with "structural imbalances" in
the labour market, and sometimes in other ways. For a general dis-
cussion of the concept, see Denton and Spencer (1978).

2. In its pure form, this is the "putty-clay" model of production theory:
capital is flexible at the investment stage but once the plant has
been built it cannot be adapted to different uses.

3. See Denton (1981).

4. References to the official policy of federal-provincial cooperation in
the area of immigration were provided in Chapter 2. However, this
applies only to immigration from other countries, of course, and not
to interprovincial migration. Moreover, even in the case of foreign
immigration there seems little doubt that the federal government's
wishes would prevail in any conflict over policy.

5. Assistance in finding jobs may be available from government for those
who take government-provided training, and this may help to reduce
search time. However, the point still remains: average search time
is not zero for persons emerging from training programs and, in
general, training time cannot be viewed as a one-for-one replacement
of search time.

6. The provision of training to persons who are unemployed may, of course,
be motivated by considerations of shorter-run stabilization policy, in
which case the fact that the unemployed may not be the most suitable
trainees is irrelevant. The point has force only if one is viewing
training programs from the point of view of their efficiency in
improving the overall skill and productivity levels of the labour
force.

7. On these issues, see Newton, Betcherman, and Meltz (1981) and Denton
(1981).

CHAPTER 7

A THEORETICAL MACROMODEL AND SOME ILLUSTRATIVE SIMULATIONS

1. INTRODUCTION

The purpose of the last chapter was to set forth and discuss those issues that are relevant to an understanding of the macroeconomic effects of manpower policies. The purpose of the present one is to explore further some of the issues and to establish more firmly their quantitative importance. The vehicle for this purpose is a mathematical model of an economy in which manpower training and immigration are provided for and their effects on the labour force, productivity, and level of production are explicitly recognized. The model is a highly simplified and theoretical one: it does not represent the Canadian or Ontario economies in any specific sense. However, it has been designed to have some of the general features which are characteristic of such economies and which must be taken into account in the assessment of manpower-policy effects at the macrolevel. Given more or less realistic values for its parameters, the model can be used to simulate the consequences that manpower training and immigration may be expected to have in terms of economic activity levels and growth paths as the economy responds over time to policy changes.

The basic features of the model are discussed in section 2, a detailed description is provided in section 3, and some of the model's limitations and special features are emphasized in section 4. Section 5 describes the manner in which the model is adapted and used for purposes of computer simulation. Sections 6-12 describe a series of simulation experiments and comment on their results. Section 13 summarizes the more important conclusions to be drawn from the experiments. The experiments

are designed to illustrate the relationships between training benefits and costs at the macrolevel, the implications of lags in the adjustment of production processes to changes in the availability of labour and capital resources, the implications that different patterns of productivity growth have for the effectiveness of manpower training, the implications of differ-- ent patterns of population growth, the effects of immigration on the labour force and on the economy as a whole, and the manner in which returns to scale in production may modify the effects of training and immigration.

This chapter is necessarily quite technical. The reader who is not interested in technical material may wish to omit it. Alternatively, he may wish to read section 2, which discusses the model in broad terms, and section 13, the final one, which provides a general summary of the experimental results and what they mean for a proper understanding of the consequences of manpower policies.

2. BASIC FEATURES OF THE MODEL

The model assumes that there are three types of input into production processes: skilled labour, unskilled labour, and capital. Skilled labour can be obtained either by training unskilled workers or as a result of immigration. The stock of capital is augmented each year by new investment and depleted by depreciation. Investment is a function of income, and thus reponds to changes in the aggregate level of production. The assumption of only two types of labour involves, of course, a high degree of abstraction. Allowance for more than two types could be made but this would complicate the model without enhancing its usefulness for the purpose at hand: the basic effects of manpower policy can be illus- trated quite adequately with only two types.

Production possibilities expand as a result of advances in

technology and changes in the availability of labour and capital resources. However, realization of the possibilities may require changes in methods of production and the economy may not be able to make these changes immediately. Adjustment delays mean that some of the available resources may be unemployed for a period and that levels of output and income may therefore fall short of their potential.

The government has three instruments of manpower policy with which to influence economic activity and growth rates. It can change the proportion of new labour force entrants who take training, and thus become skilled, and it can control both the volume and skill proportion of immigrant labour.

An increase in the level of manpower training implies a future increase in the ratio of skilled to unskilled labour force, and hence in the potential level of production in the economy. However, in the short run it may imply costs as a consequence of diverting some resources away from production and into the training activity. The time spent by trainees in a training program represents an opportunity cost to the economy, insofar as they would otherwise have been working as unskilled labour. In addition, training personnel and capital facilities are required by the program, and these two may have opportunity costs. To the extent that there are unemployed resources, the costs will be reduced; if there is no such unemployment, the economy must pay in full for the training program by sacrificing present production and income. The net advantage of the program may be assessed by comparing present costs with anticipated future benefits.

The use of immigration as a source of manpower avoids training costs. However, immigrants are consumers as well as workers, and they

thus reduce the amount of product available for consumption by the domestic population. The total output of the economy may increase but the more important question is whether output per capita will rise as a result of immigration.

The stock of skilled labour is augmented each year by inflows of newly trained workers and skilled immigrants. At the same time, it is continually being depleted by death and retirement. (It is also depleted by emigration; however, this can be ignored if immigration is defined as net of emigrants.) To maintain a given ratio of skilled to unskilled labour force requires a certain level of training activity each year, a certain level of skilled immigration, or a combination of the two.

The extent to which the average skill level of the labour force can be altered through manpower training depends on the proportion of young people who take training. But it depends also on demographic factors. A population that is growing as a result of natural increase -- an excess of births over deaths -- will have an age distribution that is tilted toward the younger end, and hence a larger ratio of new entrants to existing labour force. This implies greater "leverage" for manpower training: the average skill level of total labour force can be altered more rapidly through training because of the greater proportion of trainable youth in the total.

The foregoing broad features are all embodied in the model defined for purposes of this chapter. Any model represents an abstraction from reality, of course, and a number of features of the real world are ignored in the present one. One such feature is the diversity of occupational

skills: as noted above, the assumption of only two types of labour is a
severe abstraction, but one which serves to simplify the model without
diminishing its present usefulness. Questions of income distribution
are ignored also, and this deserves special comment. As we have suggested
in the previous chapter, such questions are important in assessing the
overall economic impact of manpower policies. However, they are very
difficult to deal with in a broad macroeconomic context, and we ignore
them for present purposes. Changes in income distribution may be going
on "behind the scenes," so to speak, but they are not allowed to exert
an influence on the aggregate measures of economic activity with which we
are here concerned. Wage levels, tax rates, training allowances, and
other income-related variables may all be varying but the macroeconomic
aggregates are unaffected : saving and consumption are assumed proportional
to income, and hence independent of how income is distributed. The welfare
implications of differing distributions are ignored also; only gross
indicators such as per capita output and unemployment rates are considered.

3. THE MODEL IN DETAIL

We turn now to the details of the model. The equations, as set
forth in the accompanying list, are organized under seven headings:
production; employment and labour force; manpower training; immigration;
population; capital stock; and underutilization of resources. We shall
discuss the equations under each heading, in turn.

Production

The production sector of the model is represented by equations
(1) - (5). Potential output (Q^*) is determined in equation (1) by a

production function of Cobb-Douglas form but with allowance for variable returns to scale and differential rates of technical progress associated with different inputs. (Returns to scale are represented by the parameter r, which has value 1 in the case of constant returns; annual rates of technical progress are represented by ρ_0, ρ_1, and ρ_2.) There is a single output (defined in real or physical terms) and there are three inputs -- unskilled labour (E_1), skilled labour (E_2), and capital stock (K).

The input-output ratios associated with potential output (ϕ^*) are given in equations (2). However, the production process may be subject to adjustment lags, and the actual input-output ratios (ϕ) are determined by the partial adjustment mechanism represented by equations (3). Given the ϕ-values, the production process for any given year takes the form of a Leontief-type fixed-coefficient scheme, and actual output (Q) is determined accordingly, in equation (4). The rate at which actual output moves towards the potential level depends on the speed of adjustment parameter, λ: with $\lambda=1$, adjustment is instantaneous, and actual output always equals potential output; with $\lambda=0$, there is no adjustment, and the economy is forever locked into a fixed input-output technology.

Equation (5) is simply a definition of the annual rate of growth of output per capita (q). In experiments with the model we shall focus on the level and growth rate of per capita output, as well as the labour force skill ratio and the rates of underutilization of resources, as defined below; we shall regard these as the variables of chief interest in assessing the macroeconomic effects of manpower policies. It is assumed that a constant fraction of output (γ) is saved and invested, and hence that a constant fraction ($1-\gamma$) is consumed. Consumption per capita thus moves in proportion

to output per capita and there is no need to consider it as a separate proxy for "welfare" in the context of the model, as one might otherwise wish to do.

Employment and Labour Force

The relations bearing directly on the labour force and on employment in the production sector are represented by equations (6) - (14). The number of unskilled workers available for employment (E_1) is determined in equation (6); it is equal to the number in the previous year (adjusted for mortality at an assumed constant rate, d), minus retirements (R_1), plus new entrants to the labour force (A) and unskilled immigrants (M_1), and minus reductions associated with training. If trainees are entirely unavailable for work during the training period, the latter reduction is simply equal to the number of new trainees (T). However, allowance is made for the possibility that training does not require complete withdrawal: a parameter ϵ is provided in equation (6), with value equal to 1 if there is complete withdrawal, 0 if there is none, and some positive fraction for intermediate cases. For $0 < \epsilon < 1$, the reductions because of training are the losses at the time of enrolment (ϵT) and the subsequent losses when the trainees graduate and transfer to the skilled category. Assuming that the training period is h years in duration, and allowing for mortality during the period, the loss associated with graduation is $(1-\epsilon)(1-d)^h T_{t-h}$. (If ϵ is 1, the entire loss takes place at the time of enrolment, it may be noted; there is no subsequent loss upon graduation. If ϵ is 0, on the other hand, the entire loss takes place at the time of graduation.)

The number of skilled workers available for employment in the production sector (E_2) is determined in equation (7), along similar lines.

Instructors in the training sector (I) are drawn from the stock of skilled workers, and the total number of skilled workers is therefore equal to E_2 + I. The number of skilled workers available for employment in production is equal to the total number of skilled workers a year ago (adjusted for mortality), minus retirements, minus the instructors required for training this year, plus skilled immigrants, and plus the number of graduating trainees. (The latter is $(1-d)^h T_{t-h}$, the number who enrolled h years ago, adjusted for mortality.)

The number of new entrants to the labour force (A) is assumed to be a given fraction of the previous year's total population (N), as it would be if the population were constant or subject to steady-state growth. This assumption is embodied in equation (8).

Retirements are determined in equations (9) and (10). The working life (inclusive of the training period) is assumed to be ω years in length. Subject to adjustments for mortality, the retirees in any year are thus equal to the number of new entrants of young people ω years earlier, plus those immigrants who joined the labour force at various ages in previous years and have now reached retirement age. Retirements of unskilled workers are calculated on this basis in equation (9) and retirements of skilled workers in equation (10).

The total labour force in each category (L_1, L_2) and the overall total (L) are determined in equations (11)-(13). The unskilled labour force is defined as the number of unskilled workers available for employment in the production sector plus that fraction of the stock of persons in training that represents withdrawals from the production sector (ϵS). The skilled labour force is defined as the number of skilled workers available for employment in the production sector plus the number of instructors in the

training sector. The overall labour force is the sum of its skilled and unskilled components.

The labour force skill ratio (s) is defined in equation (14) as L_2/L. As noted above, this ratio is regarded as one of the variables of chief interest in assessing the impact of manpower policies.

Manpower Training

The manpower training sector is defined by equations (15)-(18). The number of persons enrolling for training in a given year is obtained by applying the training ratio (τ) to the number of new labour force entrants. The total stock of persons in training in any year (S) is then the sum of enrolments over the current year and the previous h-1 years, adjusted for mortality. Given the stock of trainees enrolled, the number of skilled instructors required (I) is determined on the assumption of a fixed instructor-trainee ratio. The capital facilities required for training are then determined, in equation (18), by assuming a capital-instructor ratio. The latter ratio is taken to be some fraction (ϑ) of the capital-skilled-labour ratio in the production sector (K/E_2).

Immigration

Total immigration is assumed to be some fraction (m) of the population in the previous period, this fraction being one of the instruments of manpower policy. Immigrants are assumed to have the same age composition as the domestic population, and the same overall ratio of labour force to population (p). Annual immigration to the labour force is calculated on this basis in equation (19). (The assumption of the same composition as the domestic population represents some distortion of reality. However, this is of only minor consequence for present purposes and the assumption

avoids a number of troublesome complications.)

Immigration to the labour force is apportioned among skilled and unskilled workers in accordance with an assumed skill ratio (σ). The skill ratio is also an instrument of manpower policy. The apportionment is effected in equations (20) and (21).

Population

The labour force is assumed to be a constant proportion (p) of the population. The population is determined in equation (22) by inverting this relation. The rate of growth of the population (g) is defined in equation (23) as the sum of the natural rate (n) and the rate resulting from immigration (m).

Capital Stock

The capital stock available for production (K) is equal to the total stock in the previous year, including the portion used in the training sector (F), adjusted by a constant depreciation rate (δ), augmented by new investment, and reduced by the amount of stock required for training in the current year. Investment is equal to saving and both are equal to a constant fraction (γ) of output. The capital stock is dated at the start of the year and it is assumed that new investment in any year does not become productive until the following one, and that it is not subject to depreciation until then. These assumptions are embodied in equation (24). A concomitant assumption is that capital is freely mobile between the production and training sectors. (The same is true of skilled workers, who may move without restriction between employment in production and employment as training instructors.)

Underutilization of Resources

Underutilization of skilled or unskilled workers may arise in the model as a result of delays in the adjustment of production processes to changing labour availability or to technical progress. Such underutilization is determined in equations (25), in the form of unemployment rates. Similarly, the economy's stock of capital may be underutilized for the same reason, as indicated in equation (26). It should be noted that the unemployment rates pertain only to adjustment delays; other forms of unemployment (seasonal, normal frictional) are assumed to be constant and caught up in the definitions of the employment variables. (Thus, E_1 and E_2 may be regarded as incorporating a normal allowance for unemployment during the year without affecting the specification of the model in any way.)

4. LIMITATIONS AND SPECIAL FEATURES OF THE MODEL

As with all models, this one has limitations and particular features which should be kept in mind in the interpretation of results based upon it. The use of the Cobb-Douglas form to represent the long-run production function represents one limiting feature. This function implies a constant elasticity of substitution of unity. Other CES functions could be incorporated into the model instead, or other functions in which the substitution elasticity was allowed to vary. However, we regard the Cobb-Douglas form as adequate for our present purposes, which are chiefly illustrative. Moreover, we have made econometric estimates of other CES functions using Canadian time-series data and found the Cobb-Douglas one to perform at least as well as any other, in terms of a conventional maximum-likelihood criterion. The likelihood function is highest within a rather narrow range of parameter values which encompasses the Cobb-Douglas

form. Within this range, though, the likelihood function is rather flat, which rules out fine discrimination among alternatives and leaves open the possibility that the "true" function is somewhat different.

Another feature of the model is that wage and price adjustments are implicit rather than explicit. Such adjustments are obviously important in determining the relative advantages or disadvantages to individuals of choosing one occupation over another, and hence in determining the demand for training. They may be important too in providing the incentives or disincentives for labour force participation and for international or interregional migration. We assume that such adjustments are going on "behind the scenes." If the government wishes to set the training ratio at some particular level, for example, it must provide training allowances or other incentives sufficient to induce the required number of persons to enrol as trainees. However, the model is structured in such a way that the adjustments need not be made explicit. Income distributions are implicitly changing but the assumption that saving is strictly proportional to aggregate income means that the rate of capital accumulation is unaffected by distributional changes alone. The aggregate participation rate may well respond to changes in wage levels, as well as in other variables, but we have chosen to ignore such effects in the interest of keeping the model relatively simple. The short-run adjustment of factor ratios in production would be expected to reflect changes in relative prices but we have taken the simple route of assuming a partial adjustment mechanism in which relative prices do not play an explicit role. (Again, one may assume the price adjustments to be going on "behind the scenes.")

The assumption of a constant (implicit) unemployment rate is

another important feature. In a model concerned more particularly with
the short run, or with training and immigration as instruments of
stabilization policy, this would obviously be unacceptable. However,
our interest is in longer-run policies aimed at increasing the product-
ivity or size of the labour force, and this implies that the focus of
concern is the supply side of the economy. To put it differently, we
are concerned with the effects of policies on the productive capacity
or potential of the economy, rather than on its actual performance, which
may reflect a host of circumstances bearing on its demand side. Thus we
simply assume that workers experience a certain "normal" proportion of
unemployment during a year, and employment and labour force are defined
as units of labour net of losses resulting from such unemployment. The
effects of unemployment on migration and labour force participation
incentives are implicitly assumed to be constant at levels implied by
the "normal" unemployment rate.

5. USE OF THE MODEL IN SIMULATION

Given a set of initial levels for the variables of the model and
a set of values for its parameters, the model can be moved forward in
simulated time, year by year. A change in manpower training or immigration
can be introduced and its consequences for the time path of the economy
investigated. The sensitivity of the results to the characteristics of
the population and the economy can be explored by repeating experiments
under different assumptions about particular parameters. Some of the
economic implications of manpower policies can thus be illustrated and
evaluated in a laboratory context, so to speak.

Our approach is to start the model off in a stationary state (if
there is no population growth or technical progress) or in a condition of

steady-state growth. On the demographic side, we have used the 1971 Canadian life tables published by Statistics Canada. These tables provide a stationary population and the associated age-distribution and mortality parameters required by the model. If it is necessary that the population be subject to natural growth in some experiment, fertility rates are raised above the stationary levels until the specified steady-state growth rate is achieved, and the population age distribution is adjusted accordingly.

The minimum working age is taken to be 19 and the age of retirement to be 65 (hence $\omega = 46$). Decisions about whether to take training are made at age 18 and the ratio of 18-year-olds to total population (a) is necessarily constant under the steady-state (possibly stationary) population assumption. A constant average rate of labour force participation is assumed for all ages in the range 19-64, based roughly on recent estimates for Canada from the Statistics Canada Labour Force Survey. For any steady state, this implies a fixed ratio of labour force to total population (p). Immigrants, emigrants, and hence net immigration, are all assumed to have the same age distribution as the rest of the population. (As noted earlier, migrants are likely in practice to be more concentrated in the younger adult ages. However, this assumption is relatively harmless for present purposes and it simplifies the model considerably.)

As a standard or reference case, we assume constant returns to scale in production (r=1) and instantaneous technical adjustment to changes in resource availability ($\lambda=1$). Initially, 25 percent of the labour force are skilled and 75 percent unskilled (s=.25). Maintenance of these proportions in steady state requires that the training parameter (τ) be set to .263. The training program is two years in duration (h=2) and all

trainees are required to withdraw entirely from productive employment for that length of time ($\varepsilon=1$). A ratio of one instructor for every 25 trainees is assumed ($\pi=.04$) and the ratio of training capital to instructors is set at half the ratio of capital to skilled labour in the production sector ($\theta=.5$).

The rate of depreciation of capital stock is 5 percent per annum ($\delta=.05$) and the average (and marginal) propensity to save out of gross output is a fifth ($\gamma=.2$). The initial marginal products of labour and capital are determined by the values assigned to the β-parameters: we assume $\beta_0=.3$ and $\beta_1=\beta_2=.35$. The values of .3 for β_0 and .7 for $\beta_1+\beta_2$ are consistent with estimates that we have found appropriate for Cobb-Douglas production functions fitted to Canadian and Ontario data. The values of .35 for β_1 and β_2 represent an arbitrary division of the .7 total; together with the .25 skill proportion in the labour force, they imply that the marginal product of skilled labour is approximately three times the marginal product of unskilled labour in the initial state. Technical progress is ignored in the standard or reference case ($\rho_0=\rho_1=\rho_2=0$).

A series of experiments and associated tables are reported in the sections which follow. In each of the experiments, a manpower policy innovation is introduced by changing the level of τ, m, or σ. The subsequent effects are then analysed under different assumptions about various parameters of the model. In particular, the experiments give attention to the implications of different assumptions about training costs (as represented by π and ε), the rate of technical adjustment (λ), initial levels of unemployment and capital utilization (u_1, u_2, v), rates of technical progress (the ρ-parameters), the rate of natural population

growth (n), and the extent of returns to scale in production (r).

6. TRAINING BENEFITS AND COSTS

The three experiments reported in Table 7-1 illustrate the macroeconomic benefits and costs of an expanded training program under the assumptions of no unused productive capacity and no lags in the adjustment of production to changing resource availability. The population and the economy start off in a stationary state. There is no net migration and the training parameter τ is set initially at .263, which is just sufficient to maintain the proportion of skilled workers in the labour force at .25. The experiments were numbered 1, 3, and 4 in our original series of experiments and they are so identified in the table. (Not all experiments that were carried out are reported in this table or the subsequent ones, and hence there are some gaps in the numbering sequence.)

Experiment 1 is based on the standard assumptions set forth in the previous section. In particular, the parameters π and ε have their standard values of .04 and 1, respectively. The experiment involves the introduction of a policy designed to raise the skill proportion (s) from 25 percent of the labour force to 35 percent. This policy is given effect by increasing τ from .263 in period 0 to .368 in period 1, and then holding it at the new level. In other words, the number of young labour force entrants who are enrolled in the training program each year increases by 40 percent. As the trainees graduate, they move into the skilled-worker jobs, and the overall level of s rises. The level of output per capita (Q/N) and its rate of growth (q) respond accordingly. The values of Q/N, s, and q are shown at five-year intervals for the first

quarter-century. They are shown also for year 50 (by which time all of the old cohorts not affected by the policy change have retired from the labour force) and for the ultimate steady state which the system approaches as the policy remains in effect for an indefinitely long time.

The ultimate increase in Q/N is 9.6 percent, once the new steady state has been achieved. Thus, a 40 percent increase in training activity engenders an increase of a little under 10 percent in per capita output, once all of the economic and demographic effects have been allowed to work themselves out.

Steady-state results are of some analytical interest but of more practical concern are the effects achieved within the first decade or two, and these are seen to be relatively small. By year 10, Q/N has increased by only 1 1/2 percentage points and s has risen only from 25 to 27 percent. The economy is expanding, but at a very slow pace. By year 25, less than half of the ultimate gain in output has been achieved. The goal of raising the overall level of s to 35 percent has been attained by year 50, but even then there is some distance to go before the full effect on output is realized. Different parameter assumptions would produce different results but the general nature of the results is unlikely to be affected much. In short, the message of Experiment 1 seems clear: under neoclassical assumptions, with continuous full employment and no adjustment lags, the scope for raising overall per capita levels of output and income through manpower training policy may be quite limited over periods short enough to be of much interest in policy formulation.

Experiments 3 and 4, as reported in Table 7-1, are for the purpose of suggesting the role that training costs play in constraining the net growth of output. The relevant parameters are π and ε: the first

determines the level of resources required for training (skilled instructors and their associated capital equipment); the second determines the trainee opportunity cost, in the sense of output foregone because trainees are withdrawn from current production activity. In Experiment 3, all costs are ignored by setting π and ε to 0. In Experiment 4, π is again 0 but ε is set equal to its standard value of 1; this experiment thus allows for trainee opportunity costs only.

It is evident, under the assumptions of the model, that costs play only a minor role in determining the net increase in output. With no costs, the ultimate increase in Q/N is 10.2 percent; with all costs allowed for, the increase is 9.6 percent. It is further evident that trainee opportunity costs are the dominant element, as indicated by the fact that the results for Experiments 1 and 4 are almost identical. A major consideration in this regard is that the cost of instructors falls, inasmuch as instructors are skilled workers and the marginal product (i.e., the shadow price) of skilled labour declines sharply as the proportion of skilled workers in the economy rises. The ratio of capital to skilled labour also falls, and this reduces the capital costs involved in training. At the same time, the marginal product of unskilled labour rises, thus increasing trainee opportunity costs.

Another point to note is that costs are much larger in relation to the increase in output in the earlier years. The reason is that the output effect is cumulative whereas the cost effect is not. The annual costs of training begin when the training program (or its expansion) are initiated, but the benefits come only later, as each new cohort of graduates joins its predecessors and becomes productive.

7. THE RATE OF TECHNICAL ADJUSTMENT

A question of critical importance in assessing the effects of a training program is how fast the economy can adjust to changes in the availability of labour resources. In the context of our model, the key parameter is λ. Four new experiments, involving different assumptions about λ, are reported in Table 7-2. Also, Experiment 1 is repeated, for purposes of comparison. Instantaneous adjustment implies $\lambda=1$, which is the assumption of Experiment 1. At the other extreme, complete inflexibility implies $\lambda=0$, as in Experiment 9. Between these extremes we have chosen values of .5 ("rapid adjustment"), .2 ("slow adjustment"), and .05 ("very slow adjustment").

Experiments 6 to 9 are the same as Experiment 1 in every respect, except for the differing assumptions about λ. Training activity is again expanded in year 1 by raising τ from .263 to .368. This means that the economy is suddenly confronted with the task of adjusting its methods of production so as to absorb increasing numbers of skilled workers. In the "no adjustment" case it fails completely, of course: the increase in skilled labour simply generates unemployment and the level of output declines from 100.0 at the start of the simulation to an ultimate level of 85.7. (Note that the population is constant, so that the proportionate reduction is the same for Q as for Q/N.) In all other cases, output eventually rises to the same level as in Experiment 1 (109.6). However, the time paths are quite different. In the "very slow adjustment" case, Q/N declines immediately, and even after 50 years it has not returned to its starting level. In the "slow adjustment" case the original level has not been attained after 10 years.

These experiments are somewhat unrealistic in that they imply that skilled workers could not take unskilled jobs. Clearly that is not so: faced with the alternative of unemployment, many skilled workers would seek unskilled employment. If all unemployed skilled workers did so, the economy would simply have lost the output foregone during training: newly acquired skills would be unused and the output that could have been produced in lieu of the training program would have been sacrificed. However, the experiments serve to highlight the quite realistic possibility that the intended effects of a training policy (as represented by Experiment 1) may in fact be unattainable because of adjustment lags.

8. TRAINING EFFECTS WHEN SKILLED LABOUR IS A BOTTLENECK

The experiments thus far have assumed that when the expansion of training activity takes place the economy is operating at full employment. In Table 7-3 we present a number of experiments which take off from a situation in which this is not the case. Skilled labour is a bottleneck: there is unemployment of unskilled labour and unused capital stock because of an insufficiency of skilled workers. To set up these experiments, we have imposed an exogenous shock on the input-output ratios in year 0 such as to make the initial values of u_1 and v approximately 10 percent. There are then two effects of training policy to be observed. First, it increases the economy's potential output by raising the average skill level of the labour force. Secondly, it increases the actual level of output by augmenting the scarce factor of production and thereby increasing the employment possibilities for the other factors.

Experiment 1 is repeated in Table 7-3, for comparison with the others. An important consideration in assessing the effects of training policy when there is unemployment is the speed with which the economy can

shift its input-output ratios, as determined in the model by the value assigned to λ. In Experiment 10, λ is set equal to .2, the "slow adjustment" value; in Experiment 11, it is set equal to .05, the "very slow adjustment" value. (In Experiment 1, it will be recalled, λ is equal to 1, implying instantaneous adjustment.)

Experiments 10 and 11 assume an expansion of training activity in year 1 of the same magnitude as in Experiment 1. This is expected to reduce the levels of u_1 and v. However, it would be a mistake to attribute all reductions of u_1 and v to this cause because the economy would tend to adjust its factor use in any event so as to move back towards full employment. Experiments 10A and 11A are therefore provided for comparison. Experiment 10A is the same as 10 except that 10A involves no expansion of training activity, and similarly with regard to 11 and 11A.

The ultimate increase in output is almost 22 percent in both Experiment 10 and Experiment 11. However, just over half of this increase is the result of the "natural" elimination of unemployment: left to itself, the economy would have increased its output level by slightly more than 11 percent, as evidenced by Experiments 10A and 11A. What the expansion of training activity does do is to speed up the adjustment process. This is especially noticeable in the "very slow adjustment" case. Left to itself, the economy expands production by 2.2 percent in the first five years and by 3.9 percent in the first ten (Experiment 11); with increased training it expands by 5.0 and 8.3 percent over the same periods. Concomitantly, unemployment of unskilled workers is eliminated much more rapidly and the level of capital underutilization reduced more sharply. Indeed, the new training policy turns out to be too ambitious: by the end of the first

decade, unskilled workers are no longer unemployed but surpluses of skilled workers have developed. These surpluses persist for a long time, especially in the "very slow adjustment" case, where they are still rising even after 50 years.

In sum, then, the effectiveness of manpower training may well be greater if it takes place in a situation in which there is a shortage of skilled labour which prevents other resources from being utilized fully. In the context of actual policy formulation this suggests, of course, the importance of determining which types of skills are in short supply -- or, more realistically, will be in short supply in the future, since there are lags in setting up a training program and in the issue of graduates from it. At the same time, the possibility that the economy is capable of "natural" adjustment which would tend to correct the labour imbalance automatically should be recognized. Manpower training may facilitate adjustment but it may not be the only cause of it, or even the most importance cause.

9. TRAINING EFFECTS AND TECHNICAL PROGRESS

To this point we have assumed no technical progress. The experiments reported in Table 7-4 replace this assumption with three alternatives. Experiments 14 and 14A assume a rate of 1 percent per annum affecting all inputs equally; training activity is expanded in period 1 in Experiment 14, as in earlier experiments, while there is no expansion in Experiment 14A. The effects of training can thus be inferred by comparing the results of these two experiments. Experiments 15 and 15A assume that technical progress is embodied only in labour, the rate being 1 percent for both skilled and unskilled workers. Experiments 16

and 16A go further and assume that technical progress is embodied

only in skilled labour, again at 1 percent. Experiments 15 and 16

involve an expansion of training activity while 15A and 16A do not.

The results of these experiments are reported in the same

way as before except that results for year 100 are shown instead of

steady-state results. With a constant rate of technical progress,

Q/N rises continuously and thus has no finite steady-state level. (The

rate of growth (q) has final steady-state value equal to the initial

value.)

The results of these experiments are quite similar to those

of Experiment 1, in which there is no technical progress. The effect

on growth rates is virtually the same in all cases. For example, q is

1.67 percent in year 5 in Experiment 14 and 1.44 in Experiment 14A, a

difference of .23 percentage points, which is exactly the difference

induced in Experiment 1. Similar observations hold for the other years

and other experiments. Under the assumptions of the model we are using,

the effects of training combine with the affects of technical progress in

a straightforward manner. Eventually the training effects vanish and the

economy returns to its original steady-state rate of growth. The level

of Q/N is ultimately raised by a little less than 10 percent, as it was

in Experiment 1, but its growth rate is what it would have been had there

been no expansion of training activity.

10. TRAINING AND THE NATURAL RATE OF POPULATION GROWTH

The assumption of a stationary population is dropped in the new

experiments reported in Table 7-5. Experiments 18 and 19 assume steady-state

annual population growth rates of 1 percent and 2 percent, respectively.

Experiments 20 and 21 assume declines of 1 percent and 2 percent. These rates of growth or decline are induced by setting fertility rates at appropriate levels, leaving mortality rates the same as in the previous experiments, and continuing to assume no net migration. The results for Experiment 1 are repeated, for purposes of comparison.

Population growth tilts the age distribution of the labour force towards the younger end, thus increasing the proportion of new entrants each year. An increase in the proportion of young people trained therefore has a greater effect on the average skill ratio than in the stationary case. The proportion of retired people in the population is lower, which tends to raise the ratio of workers to dependents. However, the proportion of dependent children is higher, which tends to lower the ratio. The overall effect on output per capita is therefore not obvious in advance of simulation. All of the effects are reversed if the population is declining instead of increasing.

The results shown in Table 7-5 reflect these effects. The proportion of skilled labour (s) rises more rapidly in Experiments 18 and 19 and more slowly in 20 and 21. To take the two extremes, s rises from 25.0 percent to 27.7 percent by year 10 when the population is growing at 2 percent per annum, whereas it rises only to 26.4 percent when the population is declining by 2 percent. Eventually, of course, s rises to 35 percent in all cases; the differences are in the rates of approach to the ultimate level, not in the level itself.

There are similar differences in the movements of per capita output. Q/N rises more rapidly in the earlier periods if there is population growth. By year 10 it has increased by 2 percent in Experiment 19, but by only 1.1 percent in Experiment 21. The ultimate steady-state

levels of Q/N are different because of the differences in age
distribution. However, the differences among these levels are very
small.

The overall impression conveyed by Table 7-5 is that even
extreme variations in population growth rates have only minor conse-
quences for the effectiveness of training policy. The time path of the
training effects may be altered but the magnitude of the effects
is not changed drastically.

11. THE EFFECTS OF IMMIGRATION

So far all experiments have all been concerned with the effects
of training. Now we consider the effects of immigration, the other broad
instrument of manpower policy. The experiments reported in Table 7-6 are
designed to throw light on these effects under alternative assumptions
about the skill content of immigration and the rate of technical adjustment,
as represented by λ. The latter parameter is of some importance inasmuch
as it determines the rate at which the economy will absorb immigrants into
employment.

The standard assumption in all of the experiments of Table 7-6 is
that net immigration is half of one percent of the population per annum
$(m=.005)$. In Experiment 22 it is assumed that immigration is "skill-neutral,"
which is to say that its skill proportion is exactly that which will leave
the overall skill ratio of the labour force unaffected. (Specifically, the
requirement is that σ be equal to .262 in order that s remain at 25 percent.)
The value of λ is set at 1 in this experiment, implying instantaneous
absorption, and hence no induced unemployment.

Experiment 23 differs from Experiment 22 by assuming that
immigration is "skill-augmenting," based on a value of .5 for σ. The
other experiments repeat 22 and 23 under alternative assumptions about
λ. Experiments 24 and 25 assume "slow technical adjustment" ($\lambda=.2$);
Experiments 26 and 27 assume "very slow technical adjustment" ($\lambda=.05$).

Immigration reduces the level of per capita output in every
case: Q rises because of the increase in labour availability but Q/N
falls. This is true even when the skill proportion is twice as high
for immigrant workers as for the domestic population. In final steady
state, Q/N is 4 percent below its initial value when immigration is
skill-neutral and 1 percent below when immigration is skill-augmenting.

The overall proportion of skilled workers in the economy rises
when σ is set at .5, as one would expect. However, the rise is rather
modest. The ultimate level of s is 27.5 percent, compared with the
initial 25 percent. Immigrants bring their skills with them but the
children of immigrants must be trained in the new country, just like the
rest of the population. The direct effects of immigration in any period
on the skill content of the labour force last only as long as the first-
generation immigrants remain in the labour force. With continuous
immigration, the pool of skilled labour is being fed each year but it
is being drained at the same time by the retirement of the immigrants of
previous years. The net steady-state effect is the increase of 2.5
percentage points in s; this is achieved after the new immigration policy
has been in effect for 46 years, the assumed length of working life.

The reduction of per capita output occurs even when instantaneous
technical adjustment is assumed. If λ is less than 1 (but greater than 0),

the ultimate steady-state effects are the same but the levels of Q/N
are further depressed at every point along the path towards the steady
state. When immigration is skill-neutral and $\lambda=1$, Q/N falls from 100.0
to 98.7 by year 10; if $\lambda=.05$, it falls to 96.0 and there is substantial
unemployment, reflecting the difficulties that the economy is having
in absorbing the inflow of workers from abroad. Eventually the economy
makes a full adjustment and the unemployment vanishes. However, this
may take a very long time. Even after 50 years there is unemployment
when λ is less than 1, and in the "very slow adjustment" case the
unemployment rates remain quite high.

The foregoing results are generally predictable, given the
assumptions of the model and the experiments. Immigration augments the
stock of labour but not the stock of capital, and thus reduces labour's
marginal product. The population and the labour force increase in the
same proportion, but with constant returns to scale (as assumed) output
increases by a lesser proportion; hence Q/N falls. A higher skill
proportion among immigrants tends to offset the tendency for Q/N to fall,
but the net effect is still negative in the experiments reported here.
If skilled labour were a bottleneck and there were initial unemployment
of other resources, immigration with a high skill content would assist in
moving the economy more rapidly towards full employment, and the gains in
output levels would be greater in the earlier periods. In the long run,
though, it may be assumed that the economy would have made the adjustment
anyway; the long-run effect of immigration would thus still be to reduce
Q/N below the level it would otherwise have attained. Only if there is
sufficient immigration of real capital along with the immigration of

labour will the factor ratios be unaffected and the level of per capita output maintained, under the assumptions of the present model.

The implication of the foregoing is that the effectiveness of immigration as a tool of manpower policy depends on the existence of circumstances different from those which we have been assuming. The danger in policy planning with regard to immigration is that only the effects on the labour force and on the level of total output will be taken into consideration, with no attention paid to the effects on per capita output, which is a more realistic indicator of economic "welfare."

12. TRAINING, IMMIGRATION, AND RETURNS TO SCALE

We now investigate the effects of variable returns to scale. In Table 7-7 we repeat Experiments 1 and 22, the "baseline" experiments for training and immigration, respectively, together with three others. Experiments 28 and 29 are the same as Experiment 1, except that in 28 we assume increasing returns to scale ($r=1.1$) and in 29 we assume decreasing returns ($r=0.9$). Experiment 30 is the same as Experiment 22, except for the assumption of increasing returns to scale ($r=1.1$).

It is apparent from Experiments 1, 28, and 29 that returns to scale are of only minor consequence for the effectiveness of a training program. The short-run and long-run effects are altered but the differences are rather small.

The differences are greater in the case of immigration. With constant returns to scale, Q/N falls by almost 4 percent by year 100 (in response to an immigration rate of half of one percent of the population, starting in year 1). With increasing returns, on the other hand, Q/N rises

by more than 2 percent. However, the accumulation of returns-to-scale effects is a very slow process. Even by year 50, Q/N has not yet recovered its initial level of 100. Within the range of values of r that we have chosen -- and this seems to be a realistic range -- it appears that increasing returns to scale provide little support for the use of immigration as a tool for raising the per capita level of output or income.

13. IMPLICATIONS OF THE EXPERIMENTS: A SUMMING UP

The experiments that we have described serve to highlight several aspects of manpower policy at the macrolevel and support a number of significant conclusions. We shall summarize these.

The first conclusion is that very long periods of time may be required for a manpower training program to have any major impact on levels of per capita output or income. We have designed the experiments so as to allow for an ultimate increase of 10 percentage points in the proportion of skilled workers in the economy and of almost 10 percent in per capita output when training activity is expanded by 40 percent and there is no initial unemployment. However, a decade of expanded training increases the proportion of skilled workers in the labour force by only 2 percentage points and the level of per capita output by only 1 1/2 percent. These represent very small rates of increase on an annual basis.

The costs of training are not huge in our experiments, relative to aggregate output, but neither are they trivial. In the experiments that we have devised, the benefits in terms of expanded output outweigh the costs by a substantial margin, at least after the first few years. However, in different circumstances the potential for increasing output could be

much less and the costs could dominate. It is quite easy to define a set
of circumstances in which a training program would cause per capita income
to fall rather than rise because costs exceed benefits.

Training costs are of two kinds -- resource-use costs (training
personnel and physical facilities) and opportunity costs in terms of
output foregone because trainees are not engaged in production. The
experiments suggest that trainee opportunity costs may be the more
important of these, assuming that the trainees would in fact have been
employed in the absence of the training program. The tendency for
training to decrease the marginal product of skilled workers and increase
the marginal product of unskilled workers serves to support this conclusion.

A training program may be far more effective in a situation in
which skilled workers represent a bottleneck which prevents the full
employment of other workers, and possibly of the economy's stock of capital.
This may be especially true over periods of a few years. However, it is
important to guard against attributing all increases in output and employ-
ment to an expansion of manpower training. The economy has natural
tendencies towards adjustment which would operate in any event. The role
of a training program may be to facilitate and speed up the economy's
adjustment processes rather than to substitute for them. This suggests
the critical importance of predicting labour market imbalances and
directing training activity towards those occupations in which shortages
exist or can be anticipated. An ill-conceived training program may produce
redundant skills, and thus incur costs without subsequent benefits.

The rate at which an economy can adjust to changes in resource
availability by adapting its methods of production is an important con-
sideration. Manpower planning often seems to be based on the assumption

of fixed technology, which is quite unrealistic. Adjustments may be
rapid or slow, and this determines the pace at which newly trained
workers can be absorbed into the work force and the pace at which
an economy will correct its own labour imbalances without government
intervention.

The experiments imply that general conclusions about the
effectiveness of training are not affected by the rate of technical
progress in the economy or the extent to which such progress is associ-
ated with particular factors of production. Other models, in which
technical progress enters differently, can be constructed. However,
the general conclusion reached on the basis of the model employed here
seems reasonable in the absence of a convincing argument for a different
kind of model. That conclusion is that training may raise the level of
output in some degree but that eventually the rate of growth will fall
back to what it would have been without the training.

Different rates of natural population growth imply different
age distributions. More rapid growth is associated with a population of
younger average age and a larger ratio of new entrants to total labour
force. This has some effect on the rate at which the overall skill
proportion in the labour force and the level of per capita output can be
altered by manpower training, given that young people are the most likely
candidates to receive such training. However, the experiments suggest
that this type of effect is relatively unimportant. When the steady-state
rate of population growth varies between plus 2 percent and minus 2 percent --
a very large range, by historical standards -- the observable differences
are quite small.

The use of immigration as a policy tool requires special justification. A common tendency in the context of manpower policy is to consider only the effects of immigrants on employment and aggregate output. However, migrants are also income recipients and consumers. When one considers output on a per capita basis, rather than in the aggregate, the picture may change drastically. The importation of labour without complementary importation of capital tends to reduce per capita output in our experiments, and this is true even when the skill content of migration is twice that of the domestic population. If skilled labour were a bottleneck, immigration with high skill content might help to alleviate the problem in the short or medium term, although in the long run the natural adjustment processes of the economy would tend to eliminate the problem in any event. The effect of high-skill migration on the overall skill proportion of the labour force is very slow and the ultimate increase is relatively small for levels of migration that might be re-garded as realistic. All in all, the case for using immigration as a tool of economic policy needs to be considered very carefully, and in a much broader context than that of manpower policy, as the latter is often defined. The most effective role for immigration would seem to be as a device for dealing with severe shortages of particular, well defined skills, rather than as a means of raising the skill content of the labour force over a wide spectrum or of alleviating a perceived "shortage" of labour generally. Needless to say, the effectiveness of the tool rests heavily on the ability of a government to control the inflow of labour. As we have suggested earlier, the federal government may have some scope for control but the Government of Ontario probably has very little.

It is perhaps worth a reminder that we are concerned here only with the effects of immigration on the economy. Immigration may also have far-reaching social effects; indeed, the whole character of a nation may be altered. Immigration may serve humanitarian purposes as well. It is not necessarily the case that the economic effects are the most important ones, although they seem to be the ones given most prominence in the arena of immigration policy. In any event, we would stress again the importance of viewing immigration in a broad economic and social context, rather than in a narrow context of "manpower policy" alone.

One of the arguments that has sometimes been made for immigration is that the economy is subject to increasing returns to scale and that an increase in population will have a disproportionate effect on the level of output. However, our experiments suggest that this kind of effect is not likely to be large, under reasonable assumptions about the extent of scale effects. At best, it would take many decades for the scale effects to become sufficiently great to offset the depressive effects on per capita output that emerge in the experiments with immigration. Scale effects may alter the long-run results of an expanded manpower training program too, but here they are of even lesser importance. In general, arguments based on economy-wide returns to scale seem to merit little weight in the context of manpower policies.

As we have noted, the model used in arriving at the foregoing conclusions ignores or greatly simplifies some aspects of the economy in order to concentrate attention on others, and in order to avoid undue complexity in design and application. Wage and price adjustments are not modelled explicitly, although they are clearly important and are assumed

to be taking place in the background. A particular form of long-run

production function has been used -- the Cobb-Douglas form -- and it

has been recognized that other forms might yield somewhat different

results. "Abnormal" unemployment, and demand-side fluctuations generally,

have been ignored in order to concentrate on longer-run issues relating

to productive capacity. These are all limitations of the model that we

have used. Nevertheless, we think the model is adequate for illustrating

the nature of longer-run effects of alternative training and immigration

policies and for suggesting some orders of magnitude for these effects.

THEORETICAL MODEL FOR ANALYSING THE MACROECONOMIC EFFECTS OF MANPOWER POLICY

PRODUCTION

(1) $\quad Q_t^* \quad = \quad \alpha (K_t e^{\rho_0 t})^{r\beta_0} (E_{1t} e^{\rho_1 t})^{r\beta_1} (E_{2t} e^{\rho_2 t})^{r\beta_2}$

(2) $\quad \phi_{0t}^* \quad = \quad K_t/Q_t^*; \quad \phi_{1t}^* \quad = \quad E_{1t}/Q_t^*; \quad \phi_{2t}^* \quad = \quad E_{2t}/Q_t^*$

(3) $\quad \phi_{it} \quad = \quad \lambda \phi_{it}^* + (1-\lambda)\phi_{i,t-1}$ $\hspace{4cm}$ (i=0,1,2)

(4) $\quad Q_t \quad = \quad \min \left\{ K_t/\phi_{0t}; \quad E_{1t}/\phi_{1t}; \quad E_{2t}/\phi_{2t} \right\}$

(5) $\quad q_t \quad = \quad [(Q/N)_t / (Q/N)_{t-1}] - 1$

EMPLOYMENT AND LABOUR FORCE

(6) $\quad E_{1t} \quad = \quad (1-d)E_{1,t-1} - R_{1t} + A_t - \epsilon T_t - (1-\epsilon)(1-d)^h T_{t-h} + M_{1t}$

(7) $\quad E_{2t} \quad = \quad (1-d)(E_{2,t-1} + I_{t-1}) + (1-d)^h T_{t-h} - R_{2t} - I_t + M_{2t}$

(8) $\quad A_t \quad = \quad aN_{t-1}$

(9) $\quad R_{1t} \quad = \quad (1-d)^\omega (1-\tau_{t-\omega})A_{t-\omega} + \sum_{k=1}^{\omega}(1-d)^k b_k M_{1,t-k}$

(10) $\quad R_{2t} \quad = \quad (1-d)^\omega \tau_{t-\omega} A_{t-\omega} + \sum_{k=1}^{\omega}(1-d)^k b_k M_{2,t-k}$

(11) $\quad L_{1t} \quad = \quad E_{1t} + \epsilon S_t$

(12) $\quad L_{2t} \quad = \quad E_{2t} + I_t$

(13) $\quad L_t \quad = \quad L_{1t} + L_{2t}$

(14) $\quad s_t \quad = \quad L_{2t}/L_t$

MANPOWER TRAINING

$$(15) \quad T_t = \tau_t A_t$$

$$(16) \quad S_t = \sum_{k=0}^{h-1} (1-d)^k T_{t-k}$$

$$(17) \quad I_t = \pi S_t$$

$$(18) \quad F_t = \theta(K_t/E_{2t})I_t$$

IMMIGRATION

$$(19) \quad M_t = pm_t N_{t-1}$$

$$(20) \quad M_{1t} = (1-\sigma_t)M_t$$

$$(21) \quad M_{2t} = \sigma_t M_t$$

POPULATION

$$(22) \quad N_t = L_t/p$$

$$(23) \quad g_t = n + m_t$$

CAPITAL STOCK

$$(24) \quad K_t = (1-\delta)(K_{t-1}+F_{t-1}) + \gamma Q_{t-1} - F_t$$

UNDERUTILIZATION OF RESOURCES

$$(25) \quad u_{it} = (E_{it}-Q_t\phi_{it})/L_{it} \qquad (i=1,2)$$

$$(26) \quad v_t = (K_t-Q_t\phi_{0t})/(K_t+F_t)$$

DEFINITIONS OF SYMBOLS

Greek Symbols

α -- scale parameter in full-adjustment production function

β_0 -- parameter associated with capital in full-adjustment production function

β_1 -- parameter associated with unskilled labour in full-adjustment production function

β_2 -- parameter associated with skilled labour in full-adjustment production function

γ -- gross savings ratio

δ -- rate of depreciation of capital stock

ε -- proportion of training time withdrawn from productive employment

θ -- parameter in training facilities equation

λ -- rate-of-adjustment parameter in determination of input-output ratios

π -- ratio of instructors to trainees

ρ_0 -- rate of technical progress embodied in capital

ρ_1 -- rate of technical progress embodied in unskilled labour

ρ_2 -- rate of technical progress embodied in skilled labour

σ -- proportion of labour force migrants who are skilled

τ -- proportion of domestic labour force entrants who enrol for training

ϕ -- actual input-output ratio

ϕ^* -- input-output ratio implied by full-adjustment production function

ω -- length of working life of domestic labour force entrants

Latin Symbols

A -- addition to the labour force represented by domestic entrants

a -- ratio of domestic labour force entrants to total population

b_k -- proportion of immigrants with k years before retirement

d -- mortality rate (per period) during working life

E_1 -- unskilled workers available for employment in production sector

E_2 -- skilled workers available for employment in production sector

F -- capital facilities used in training sector

g -- population growth rate

h -- length of training period (integer multiple of the time unit)

I -- employment of instructors in training sector

i -- subscript indicating input (0 for capital, 1 for unskilled labour, 2 for skilled labour)

K -- capital stock available for use in production sector

k -- time lag

L -- total labour force

L_1 -- unskilled labour force

L_2 -- skilled labour force

M -- total net labour force immigration

M_1 -- net immigration of unskilled workers

M_2 -- net immigration of skilled workers

m -- ratio of net immigration to population of previous period

N -- total population

n -- rate of natural increase of population

p -- ratio of labour force to total population

Q -- actual output of production sector

Q^* -- output based on full-adjustment production function

q -- rate of growth of output per capita

R_1 -- retirements of unskilled workers

R_2 -- retirements of skilled workers

r -- returns-to-scale parameter associated with full-adjustment production function

S -- total stock of persons enrolled for training

s -- ratio of skilled to total labour force

T -- number of persons who enrol for training in a given year

t -- time subscript

u -- unemployment rate

v -- unused capital as proportion of total capital stock

TABLE 7-1: SIMULATED MACROECONOMIC EFFECTS OF ADDITIONAL MANPOWER TRAINING UNDER ALTERNATIVE COST ASSUMPTIONS

DESCRIPTION OF EXPERIMENT			VARIABLE	ELAPSED TIME (in years)							STEADY STATE
No.	Main features of present relevance	Parameters of special interest		0	5	10	15	20	25	50	
1	All costs at standard levels	$n=.04$ $c=1$	Q/N	100.0	100.4	101.5	102.6	103.6	104.6	108.4	109.6
			q	.00	.23	.22	.21	.20	.19	.04	.00
			s	25.0	25.8	27.0	28.2	29.4	30.5	35.0	35.0
3	No training costs	$n=0$ $c=0$	Q/N	100.0	100.7	101.9	103.0	104.0	105.0	108.9	110.2
			q	.00	.23	.22	.21	.20	.19	.04	.00
			s	25.0	25.8	27.0	28.2	29.4	30.5	35.0	35.0
4	Feature opportunity costs only	$n=0$ $c=1$	Q/N	100.0	100.4	101.6	102.6	103.7	104.6	108.4	109.6
			q	.00	.23	.22	.21	.20	.18	.04	.00
			s	25.0	25.8	27.0	28.2	29.4	30.5	35.0	35.0

NOTE: The following applies to this table and Tables 7-2 to 7-7: Q/N is output per capita, indexed to 100.0 in year 0; q is percentage rate of growth of Q/N; s is skilled labour force as percent of total labour force; u_1 and u_2 are percentage rates of unemployment of unskilled and skilled workers, respectively; v is percentage rate of underutilization of capital. All parameters have standard values unless otherwise indicated. Values are not shown for u_1, u_2, and v for those experiments in which they are necessarily zero (i.e., when λ has its standard value of 1).

TABLE 7-2: SIMULATED MACROECONOMIC EFFECTS OF ADDITIONAL MANPOWER TRAINING UNDER ALTERNATIVE ASSUMPTIONS ABOUT THE RATE OF TECHNICAL ADJUSTMENT

No.	Main features of present relevance	Parameters of special interest	VARIABLE	0	5	10	15	20	25	50	STEADY STATE
						ELAPSED TIME (in years)					
1	Instantaneous technical adjustment	$\lambda=1$	Q/N	100.0	100.4	101.5	102.6	103.6	104.6	108.4	109.6
			q	.00	.23	.22	.21	.20	.19	.04	.00
			n	25.0	25.8	27.0	28.2	29.4	30.5	35.0	35.0
6	Rapid adjustment	$\lambda=.5$	Q/N	100.0	99.9	100.9	102.0	103.0	103.9	108.1	109.6
			q	.00	.17	.21	.20	.19	.18	.07	.00
			n	25.0	25.8	27.0	28.2	29.4	30.5	35.0	35.0
			$\bar{u}_1$	.00	.00	.00	.00	.00	.00	.00	.00
			$\bar{u}_2$	.00	1.19	1.25	1.19	1.13	1.08	.06	.00
			v	.00	.32	.37	.41	.43	.46	.17	.00
7	Slow adjustment	$\lambda=.2$	Q/N	100.0	99.1	99.5	100.3	101.1	102.0	106.7	109.6
			q	.00	-.04	.12	.17	.18	.18	.22	.00
			n	25.0	25.8	27.0	28.2	29.4	30.5	35.0	35.0
			$\bar{u}_1$	.00	.00	.00	.00	.00	.00	.00	.00
			$\bar{u}_2$	.00	2.80	4.26	4.56	4.50	4.34	1.51	.00
			v	.00	.85	1.14	1.32	1.46	1.59	1.10	.00
8	Very slow adjustment	$\lambda=.05$	Q/N	100.0	98.5	97.6	97.1	96.8	96.8	99.2	109.6
			q	.00	-.25	-.15	-.08	-.03	.01	.33	.00
			n	25.0	25.8	27.0	28.2	29.4	30.5	35.0	35.0
			$\bar{u}_1$	.00	.00	.00	.00	.00	.00	.00	.00
			$\bar{u}_2$	.00	4.05	8.33	11.24	13.19	14.45	13.08	.00
			v	.00	1.32	2.16	2.73	3.18	5.57	4.34	.00
9	No adjustment (fixed input-output coefficients)	$\lambda=0$	Q/N	100.0	98.3	96.6	95.0	93.4	91.8	85.7	85.7
			q	.00	-.35	-.34	-.34	-.34	-.33	.00	.00
			n	25.0	25.8	27.0	28.2	29.4	30.5	35.0	35.0
			$\bar{u}_1$	.00	.00	.00	.00	.00	.00	.00	.00
			$\bar{u}_2$	.00	4.54	10.48	15.75	20.47	24.72	38.68	38.68
			v	.00	1.53	2.71	3.62	4.50	4.82	4.85	.00

NOTE: See note to Table 7-1.

TABLE 7-3: SIMULATED MACROECONOMIC EFFECTS OF ADDITIONAL MANPOWER TRAINING UNDER ALTERNATIVE ASSUMPTIONS ABOUT INITIAL RESOURCE UTILIZATION

	DESCRIPTION OF EXPERIMENT		VARIABLE	ELAPSED TIME (in years)							STEADY STATE
No.	Main features of present relevance	Parameters of special interest		0	5	10	15	20	25	50	
1	All resources fully utilized initially; training activity increased; instantaneous technical adjustment	$u_1=u_2=0$ in year 0; τ increased in year 1; $\lambda=1$	Q/N	100.0	100.4	101.5	102.6	103.6	104.6	108.4	109.6
			q	.00	.23	.22	.21	.20	.19	.04	.00
			s	25.0	25.8	27.0	28.2	29.4	30.5	35.0	35.0
10	Capital and unskilled labour underutilized initially; training activity increased; slow technical adjustment	u_1, v approx. 10% in year 0; τ increased in year 1; $\lambda=.2$	Q/N	100.0	109.2	110.3	111.1	112.1	113.2	118.5	121.8
			q	-10.06	1.44	.12	.17	.19	.18	.22	.00
			s	25.0	25.8	27.0	28.2	29.4	30.5	35.0	35.0
			u_1	9.88	.69	.00	.00	.00	.00	.00	.00
			u_2	.00	.00	3.16	4.21	4.39	4.31	1.51	.00
			v	10.05	.95	1.06	1.39	1.57	1.69	1.14	.00
10A	Same as Experiment 10 except no increase in training activity	u_1, v approx. 10% in year 0; τ unchanged; $\lambda=.2$	Q/N	100.0	107.0	109.4	110.2	110.5	110.7	111.0	111.2
			q	-10.06	.83	.27	.09	.04	.02	.01	.00
			s	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
			u_1	9.88	3.47	1.16	.38	.13	.04	.00	.00
			u_2	.00	.00	.00	.00	.00	.00	.00	.00
			v	10.05	2.80	.83	.35	.23	.19	.09	.00
11	Capital and unskilled labour underutilized initially; training activity increased; very slow technical adjustment	u_1, v approx. 10% in year 0; τ increased in year 1; $\lambda=.05$	Q/N	100.0	105.0	108.3	107.6	107.4	107.3	110.1	121.8
			q	-10.06	1.28	-.17	-.09	-.03	.01	.33	.00
			s	25.0	25.8	27.0	28.2	29.4	30.5	35.0	35.0
			u_1	9.88	3.95	.00	.00	.00	.00	.00	.00
			u_2	.00	.00	2.30	6.79	9.89	12.00	12.47	.00
			v	10.05	3.84	1.04	2.16	2.95	3.56	4.59	.00
11A	Same as Experiment 11 except no increase in training activity	u_1, v approx. 10% in year 0; τ unchanged; $\lambda=.05$	Q/N	100.0	102.2	103.5	105.2	106.2	107.0	109.2	111.1
			q	-10.06	.39	.29	.22	.17	.13	.05	.00
			s	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
			u_1	9.88	7.82	6.15	4.82	3.76	2.93	.83	.00
			u_2	.00	.00	.00	.00	.00	.00	.00	.00
			v	10.05	6.29	3.95	2.57	1.80	1.40	1.12	.00

NOTE: See note to Table 7-1.

TABLE 7-4: SIMULATED MACROECONOMIC EFFECTS OF ADDITIONAL MANPOWER TRAINING UNDER ALTERNATIVE ASSUMPTIONS ABOUT TECHNICAL PROGRESS

DESCRIPTION OF EXPERIMENT			VARIABLE	ELAPSED TIME (in years)							
No.	Main features of present relevance	Parameters of special interest		0	5	10	15	20	25	50	100
14	Technical progress at 1% per annum for all inputs; training activity increased	$\rho_0=\rho_1=\rho_2=.01$, τ increased in year 1	Q/N	100.0	107.8	117.1	127.2	138.0	149.7	221.8	450.8
			q	1.44	1.67	1.66	1.66	1.65	1.63	1.48	1.44
			s	25.0	25.8	27.0	28.2	29.4	30.5	35.0	35.0
14A	Same as Experiment 14 except no increase in training activity	$\rho_0=\rho_1=\rho_2=.01$, τ unchanged	Q/N	100.0	107.4	115.4	123.9	133.1	142.9	204.3	417.3
			q	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44
			s	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
15	Technical progress at 1% per annum for labour only; training activity increased	$\rho_0=0$, $\rho_1=\rho_2=.01$, τ increased in year 1	Q/N	100.0	105.5	112.2	119.2	126.6	134.4	178.9	297.5
			q	1.00	1.23	1.23	1.22	1.21	1.20	1.05	1.01
			s	25.0	25.8	27.0	28.2	2.94	30.5	35.0	35.0
15A	Same as Experiment 15 except no increase in training activity	$\rho_0=0$, $\rho_1=\rho_2=.01$, τ unchanged	Q/N	100.0	105.1	110.5	116.2	122.1	128.4	164.9	271.8
			q	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
			s	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
16	Technical progress at 1% per annum for skilled labour only; training activity increased	$\rho_0=\rho_1=0$, $\rho_2=.01$, τ increased in year 1	Q/N	100.0	102.9	106.7	110.6	114.6	118.6	139.3	180.4
			q	.50	.73	.72	.71	.70	.69	.54	.51
			s	25.0	25.8	27.0	28.2	29.4	30.5	35.0	35.0
16A	Same as Experiment 16 except no increase in training activity	$\rho_0=\rho_1=0$, $\rho_2=.01$, τ unchanged	Q/N	100.0	102.5	105.1	107.8	110.5	113.3	128.4	164.9
			q	.50	.50	.50	.50	.50	.50	.50	.50
			s	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0

NOTE: See note to Table 7-1.

TABLE 7-5: SIMULATED MACROECONOMIC EFFECTS OF ADDITIONAL MANPOWER TRAINING UNDER ALTERNATIVE ASSUMPTIONS ABOUT RATE OF NATURAL INCREASE IN POPULATION

DESCRIPTION OF EXPERIMENT			VARIABLE	ELAPSED TIME (in years)							STEADY STATE
No.	Main features of present relevance	Parameters of special interest		0	5	10	15	20	25	50	
1	No population growth	n=0	Q/N	100.0	100.4	101.5	102.6	103.6	104.6	108.4	109.6
			q	.00	.23	.22	.21	.20	.19	.04	.00
			s	25.0	25.8	27.0	28.2	29.4	30.5	35.0	35.0
18	Moderate growth	n=.01	Q/N	100.0	100.5	101.7	102.9	104.0	105.0	108.5	109.4
			q	.00	.27	.25	.22	.20	.18	.04	.00
			s	25.0	25.9	27.4	28.7	29.9	31.1	35.0	35.0
19	Rapid growth	n=.02	Q/N	100.0	100.5	102.0	103.3	104.4	105.4	108.5	109.5
			q	.00	.31	.27	.24	.21	.18	.03	.00
			s	25.0	26.1	27.7	29.2	30.4	31.6	35.0	35.0
20	Moderate decline	n=-.01	Q/N	100.0	100.3	101.3	102.3	103.2	104.2	108.2	109.7
			q	.00	.19	.19	.19	.19	.18	.04	.00
			s	25.0	25.6	26.7	27.7	28.8	30.0	35.0	35.0
21	Rapid decline	n=-.02	Q/N	100.0	100.3	101.1	101.9	102.8	103.7	108.0	109.7
			q	.00	.15	.16	.17	.18	.18	.04	.00
			s	25.0	25.5	26.4	2.73	28.3	29.4	35.0	35.0

NOTE: See note to Table 7-1.

TABLE 7-6: SIMULATED MACROECONOMIC EFFECTS OF IMMIGRATION UNDER ALTERNATIVE ASSUMPTIONS ABOUT SKILL CONTENT AND RATE OF TECHNICAL ADJUSTMENT

DESCRIPTION OF EXPERIMENT			VARIABLE	ELAPSED TIME (In years)							STEADY STATE
No.	Main features of present relevance	Parameters of special interest		0	5	10	15	20	25	50	
22	Skill-neutral immigration; instantaneous technical adjustment	m=.005 from year 1, σ=.262, λ=1	Q/N	100.0	99.3	98.7	98.3	97.9	97.5	96.6	96.0
			q	.00	-.13	-.11	-.09	-.07	-.06	-.02	.00
			s	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
23	Skill-augmenting immigration; instantaneous technical adjustment	m=.005 from year 1, σ=.5, λ=1	Q/N	100.0	99.8	99.7	99.6	99.6	99.6	99.5	99.0
			q	.00	-.03	-.02	-.01	-.01	-.01	-.01	.00
			s	25.0	25.6	26.0	26.4	26.8	27.0	27.5	27.5
24	Skill-neutral immigration; slow technical adjustment	m=.005 from year 1, σ=.262, λ=.2	Q/N	100.0	98.4	97.6	97.1	96.8	96.6	96.2	96.0
			q	.00	-.24	-.13	-.08	-.05	-.04	-.01	.00
			s	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
			u_1	.00	1.27	1.54	1.45	1.25	1.03	.33	.00
			u_2	.00	1.30	1.56	1.47	1.26	1.04	.33	.00
			v	.00	.00	.00	.00	.00	.00	.00	.00
25	Skill-augmenting immigration; slow technical adjustment	m=.005 from year 1, σ=.5, λ=.2	Q/N	100.0	98.6	98.2	98.2	98.3	98.5	99.0	99.0
			q	.00	-.17	-.04	-.01	.03	.03	.00	.00
			s	25.0	25.6	26.0	26.4	26.8	27.0	27.5	27.5
			u_1	.00	.87	1.02	.90	.70	.51	.13	.00
			u_2	.00	2.43	2.83	2.56	2.12	1.67	.21	.00
			v	.00	.00	.00	.00	.00	.00	.00	.00
26	Skill-neutral immigration; very slow technical adjustment	m=.005 from year 1, σ=.262, λ=.05	Q/N	100.0	97.8	96.0	94.7	93.7	93.0	92.8	96.0
			q	.00	-.41	-.33	-.25	-.18	-.12	.00	.00
			s	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
			u_1	.00	2.07	3.57	4.58	5.18	5.45	3.78	.00
			u_2	.00	2.13	3.63	4.65	5.26	5.52	3.83	.00
			v	.00	.00	.00	.00	.00	.00	.00	.00
27	Skill-augmenting immigration; very slow technical adjustment	m=.005 from year 1, σ=.5, λ=.05	Q/N	100.0	97.9	96.3	95.2	94.5	94.1	95.5	99.0
			q	.00	-.39	-.29	-.19	-.12	-.05	.11	.00
			s	25.0	25.6	26.0	26.4	26.8	27.0	27.5	27.5
			u_1	.00	1.44	2.53	3.28	3.72	3.90	2.36	.00
			u_2	.00	3.95	6.48	7.97	8.67	8.78	4.64	.00
			v	.00	.00	.00	.00	.00	.00	.00	.00

NOTE: See note to Table 7-1. The training parameter τ is equal to .263 in all of the experiments of this table, this being the value required to maintain s at its initial level of 25 percent in the absence of immigration.

TABLE 7-7: SIMULATED MACROECONOMIC EFFECTS OF ADDITIONAL MANPOWER TRAINING AND IMMIGRATION UNDER ALTERNATIVE ASSUMPTIONS ABOUT RETURNS TO SCALE IN PRODUCTION

DESCRIPTION OF EXPERIMENT			VARIABLE	ELAPSED TIME (in years)							
No.	Main features of present relevance	Parameters of special interest		0	5	10	15	20	25	50	100
1	Additional training with constant returns to scale	r increased in year 1 m=0 r=1	Q/N q s	100.0 .00 25.0	100.4 .23 25.8	101.5 .22 27.0	102.6 .21 28.2	103.6 .20 29.4	103.6 .19 30.5	108.4 .04 35.0	109.4 .01 35.0
28	Additional training with increasing returns to scale	r increased in year 1 m=0 r=1.1	Q/N q s	100.0 .00 25.0	100.4 .25 25.8	101.7 .24 27.0	102.9 .23 28.2	104.0 .22 29.4	105.2 .21 30.5	109.5 .05 35.0	110.8 .01 35.0
29	Additional training with decreasing returns to scale	r increased in year 1 m=0 r=.9	Q/N q s	100.0 .00 25.0	100.4 .20 25.8	101.4 .19 27.0	102.3 .18 28.2	103.2 .17 29.4	104.1 .16 30.5	107.3 .03 35.0	108.1 .00 35.0
22	Skill-neutral immigration with constant returns to scale	r unchanged m=.005 from year 1 r=1	Q/N q s	100.0 .00 25.0	99.3 -.13 25.0	98.7 -.11 25.0	98.3 -.09 25.0	97.9 -.07 25.0	97.5 -.06 25.0	96.6 -.02 25.0	96.1 .00 25.0
30	Skill-neutral immigration with increasing returns to scale	r unchanged m=.005 from year 1 r=1.1	Q/N q s	100.0 .00 25.0	99.5 -.09 25.0	99.1 -.06 25.0	98.9 -.04 25.0	98.7 -.02 25.0	98.7 -.01 25.0	99.2 .04 25.0	102.2 .07 25.0

NOTE: See note to Table 7-1.

CHAPTER 8

SUMMARY AND CONCLUSIONS

It has been our purpose in this study to examine a range of issues bearing on the appropriateness and effectiveness of manpower policy in Canada generally, and in Ontario in particular. We have given attention to the constitutional and institutional framework within which manpower programs are defined and translated into action by the federal and provincial governments, and have attempted to provide as comprehensive a picture as possible of the overall nature and extent of such programs, based on the data available. We have discussed at some length the implications of manpower programs for the macroeconomy, having regard for both the costs and benefits of the programs, and for both their direct and indirect effects on government budgets and the economy at large. To explore further and suggest the quantitative importance of some of the macroeffects, we have presented a mathematical model of an economy in which there is training activity and immigration of labour, and have used this model in a series of illustrative computer simulation experiments. We have examined also the microeconomic aspects of manpower training, having regard especially for the incentives of employers to provide for the training of their employees and of individuals to incur the costs of their own training. The question of incentives is fundamental in considering what is appropriate public policy and what types of government programs are likely to be effective, as we have tried to make clear. Equally fundamental is the question of information availability, both from the point of view of private agents in the economy and from the point of view of government planning

and policy, and we have tried to make that clear too. Our task now, in this final chapter, is to stand back from the details of the previous ones and to provide a broad picture of the present state of manpower policy in Canada and Ontario, as we see it, a summary statement of relevant issues, and a statement of the policy implications of our analysis.

We have not tried to cover all aspects of what has come to be regarded as "manpower policy." Except for a few places in the study where the context of the discussion dictated otherwise, we have excluded from consideration policies and programs concerned primarily with job creation. Our concentration has been on policies and programs designed to alter the character of the labour force, whether in size or in skill characteristics, rather than on those intended mainly to reduce the level of unemployment. Our justification for this is that it makes little sense to study "manpower policies" concerned with job creation without also studying other government policies designed to influence the level of employment, and this opens up the whole area of "stabilization policy" and the short-term influence of government on the macroeconomy generally. It was clear to us that that was much too broad an area to be covered in this particular study.

The policies with which we have been primarily concerned are those which affect the stock of labour, rather than its level of utilization at any particular time. In conventional terms, the principal instruments available to government for this purpose are training programs and immigration. Training deepens the stock of human capital available to the economy; immigration broadens it, by adding more people, but may deepen it also if the skill content of immigration exceeds that of the

domestic population. Both have effects which persist for a very long time, and possibly forever. Someone who is trained at the age of 25 may remain in the labour force for another four decades. Someone who immigrates at the same age may also be in the labour force for four decades. Moreover, the immigrant's children and grandchildren will be providers of labour long after he himself has gone. It is our view that these very long-term effects are frequently neglected in discussions of manpower policy -- that such discussions often focus much too narrowly on the short term. In the case of immigration, they often focus much too narrowly on the labour market too, in isolation from the rest of the economy and the society. Immigrants are not only suppliers of labour but earners of income, consumers, savers, and citizens of their communities as well, a point which might be too obvious to mention were it not for the fact that it seems often to be overlooked in the manpower policy context.

The distinction between "training" and "education" cannot be drawn with any precision, and there is no point in trying. "Manpower training" implies the inculcation of skills which have applicability in economic production, but in large measure that is true also of education, broadly and conventionally defined. Reading, writing, and basic mathematics are fundamental skills in an industrialized society, and the same can be said of other components of the standard educational curriculum, in varying degree. Nor is there a clear line between "training" and "learning by doing." The latter is a characteristic of everyday life, whether in the work place or elsewhere; it goes on regardless of whether there exist formal programs of manpower training. Of course, learning by doing is formalized to some extent by the

incorporation of supervised work into apprenticeship programs and of experience requirements into the certification processes for some trades and professions. But it goes on in any event. Again, these are statements of the obvious, and hardly worth making, were it not that they too seem often to be overlooked in discussions of manpower policy. The Ontario Ministry of Education and the local school boards have immense budgets and profound effects on the characteristics of the future labour force, although they are not usually regarded as agencies of "manpower policy"; the economy, in its everyday activities, is a vast process for the development and improvement of skills in those who participate in it, whether or not it encompasses manpower training programs in the usual sense. In assessing manpower training policies and programs there is a danger that too narrow a view will be taken, and this is to be guarded against.

The general educational system is fundamental in the development of labour skills, but as a practical matter it is too broad for our specific purposes in this study. We have therefore followed convention, roughly speaking, and in our statistical appraisal have concerned ourselves largely with manpower training programs as these would usually be defined. In particular, we have considered the Canada Manpower Training Program, and various specific programs operated by the Government of Ontario. To the extent that data permitted, we have given some attention also to training within the federal civil service and the armed forces. Statistical information about the extent of training activities of private employers is no more than fragmentary and suggestive, but we have done what we could in this area as well.

The largest fraction by far of government-supported and generally available training activity takes place within the framework of the Canada Manpower Training Program. The CMTP is financed out of federal revenues and was intended as an instrument of federal policy. However, its actual operations are very much influenced by the provincial governments, in consequence of the division of powers in the Canadian constitutional context, and this has had a major impact on its effectiveness as a policy instrument. The federal government determines the types and extent of training to be offered, but in Ontario it must purchase the services required to provide the training through the provincial government. Moreover, it cannot regulate the apprenticeship programs or other certification processes. Thus it effectively loses much of the control over what actually takes place within the program and over what emerges from the program in the way of specific manpower skills. The CMTP is therefore neither a purely federal instrument of manpower policy nor a purely provincial once. Under ideal circumstances, the federal and provincial governments would have identical goals, and cooperation and communication between them would be such as to eliminate conflict and ensure efficiency.

However, constitutional, political, and administrative realities intervene, and the instrument is blunted. We have made this argument in Chapter 2, following closely the analysis which was provided several years ago by Dupré et al. (1973), and which seems to us still to be valid.

As set forth in Chapter 2, the record of official pronouncements and statements of intention, by both federal and Ontario authorities, suggests a major shift within the CMTP, away from institutional forms of training, and towards "employer-centered" forms. The authorities have

decried the lack of involvement by industry and emphasized the
intention to stimulate it in the future. But no major shift has
occurred: as documented in Chapter 3, institutional training still
accounts for the bulk of the CMTP budget. Our analysis in Chapter 4
suggests that in fact this is not surprising, and that it is related
to the incentive system under which the CMTP operates. Based on
argument with a strong foundation in the theory of the profit-maximizing
firm, it seems clear that private employers have little or no incentive
to bear any of the costs of training unless the skills produced are
specific to their own needs, and not generally useful and marketable
to other employers. Most skills are not so specific, and it seems
unlikely that the CMTP would subsidize the development of highly
employer-specific skills in any event. In these circumstances,
employers would not see it as in their interest to participate in
subsidized programs unless all costs were met out of the subsidies,
or paid for by the trainees themselves. It seems not unlikely that
spokesmen for industry would pay lip service to the importance of
employer involvement, but that when the dollars were on the line the
actual participation would not be forthcoming. We have the impression
that this hypothetical situation may not be far from the real one.

Information about the training expenditures actually made
by private firms is scarce, and fragmentary at best. However, what
data are available suggest that the expenditures are relatively small.
If this is so, and if it is thought desirable to raise the level of
corporate expenditures on training as a matter of public policy, then
we think that some form of training levy scheme has much to commend it.
The federally appointed Commission on Educational Leave and Productivity

recently suggested a variant under which companies spending less than 0.5 percent of their payroll on training would be required to pay the difference to the government. We have discussed this proposal in Chapter 4 and merely note here that it, or some variant of it, may offer an effective device for ensuring some minimum amount of privately financed training and, importantly, a high degree of industry involvement in the choice of the types of training to be given and a corresponding reduction in government involvement.[1] However, further careful study is needed before the implementation of any such scheme.

We have surveyed, as thoroughly as we could, the manpower programs offered by the Government of Ontario outside the CMTP framework. In total, the expenditures on these programs are quite small, and all but one seem to be concerned more with job creation than with training. The lone exception is the Training in Business and Industry Program, and even here the expenditures have declined sharply, relative to expenditures on other programs. Manpower programs outside the CMTP framework seem thus to be rather small in Ontario, in aggregate terms. Moreover, statistical information about the programs is rather uncoordinated and difficult to come by. On several occasions during our quest for data we received the comment that no attempt had been made before to bring together data for different programs and look at the programs collectively, and that this was a good idea. We suspect that the lack of coordination and assembly of data reflects a lack of coordination of the programs themselves. It is hard to imagine that these programs could be viewed seriously as a coordinated manpower policy effort without concomitant assembly of a better data base.

(We hasten to add that we received nothing but cooperation from those who provided the data, and general commendation for undertaking the task.)

We have tried also to appraise the extent of training activity within the federal and Ontario civil service and the armed forces, in broad terms. In each case the amount of training seems to be quite significant. Some training in the armed forces is obviously specific, and of little or no use outside the forces. But much of it is not, and given the substantial rates of turnover of armed forces personnel, and the relatively young retirement ages, this has to be viewed as an important source of skills for the civilian economy. Training in the civil service is also employer-specific to some extent, but it probably has substantial general content as well. At the very least, it represents a major effort to develop skills within the government work force, quite aside from any "spill-over" to the private economy through personnel turnover. By way of indicating the relative magnitude of training effort in the federal civil service, we noted in Chapter 3 that in the fiscal year 1977-78, civil servants participating in internal training programs were equal in number to 53 percent of the total who enrolled in CMTP programs during the same period.

Incentives play a critical role in determining the effectiveness of training policy. We have considered the question of incentives from the point of view of a private firm and the point of view of an individual making a career decision. In the latter case, the decision may rest on a more or less realistic comparison of lifetime earnings possibilities. But it may rest also on the individual's ability to borrow now against future income, and here he may encounter difficulties

in the regular capital market. Government-based loan programs already exist to support students at Ontario universities and colleges, and such programs might be extended to cover other forms of training.

Information also plays an important role in individual career choice. We have suggested that information available to young people through normal channels on job availability, career prospects, training opportunities, and the like may be capable of substantial improvement. This suggestion has been made also by the federal government's Task Force on Labour Market Development in its recent report.

Information is important in another sense too. The whole point of the CMTP, and of manpower training policy generally, is to assess current and prospective labour market conditions, determine where imbalances now exist or are likely to arise, and direct training expenditures and activities accordingly. This assumes a solid foundation in economic intelligence and statistical data, and in our opinion this foundation does not exist. The statistical information base is weak. In the absence of anything better, 1971 census data have been used for many years as a basis for the projection of occupational requirements. Data from the 1981 census will become available in the near future, but these too will rapidly become out of date. The Statistics Canada Labour Force Survey is an effective vehicle for providing estimates of major labour market aggregates, and it provides a limited range of information on occupational and industrial distributions of employment. But it is a sample survey, and is simply not capable of providing reliable information at a detailed level. Yet it is exactly that kind of information which the effective operation of a manpower training program requires. The statistical

base for manpower policy decisions has never been strong but in some ways it is even weaker today than in the past. The Job Vacancy Survey introduced by Statistics Canada at the end of the 1960s was a bold new venture in the right direction, but it was allowed to die in response to pressure to cut the Statistics Canada budget. There exists, then, an anomalous situation: on the one hand, there is widespread concern about labour shortages and there are large-scale expenditures of public funds on manpower programs; on the other hand, the statistical foundation on which decisions about the allocation of these funds are based is extremely weak. It is entirely possible to waste the funds by misdirecting them, and the inadequacy of the available data base increases greatly the probability of misdirection. The inadequacy is clearly recognized by persons familiar with the data situation[2] but there is little evidence at this time to suggest that serious consideration is being given to rectifying the situation.

Manpower policies are directed at the labour market but they have implications for the whole of the economy. A training program is presumably intended to increase the number of workers with some particular skill, and thereby to increase the productive capacity of the economy. But training is not a free good. It requires the use of real resources -- instructors, other personnel, buildings, and equipment -- which could have been used for productive purposes elsewhere in the economy. Unless one can argue that the trainees would all otherwise have been unemployed, they too represent productive opportunities foregone. The question to ask, then, is whether the net increment to the economy's output is positive. In Chapter 7 we provided some examples in which this was so, but it is certainly possible to

provide other examples, in which training leads to a net reduction of output because the costs dominate the increases in productivity. At the very least, any program for manpower training should be based on as careful an analysis of potential costs and benefits as the uncertainties of the real world will permit.

In the discussion of Chapter 6 and the analysis of Chapter 7, we emphasized the importance of the model of production processes that one has in mind when considering the likely effects of training. Economic theory offers two quite different models. One, the neoclassical model, assumes that substitution among factors of production can take place freely and without delay, and that all available manpower and other resources will always be fully employed. The other, the fixed-coefficient model, assumes that methods of production cannot be modified and that all inputs must be used in given proportions; there is no adaptation through wage or price adjustments, no flexibility in resource use, and any difference between the proportions of resources available and the proportions required by the given technology must manifest themselves in the form of unemployment. As we have suggested, neither of these models is likely to be realistic in its pure form, but both have important elements of realism. Economies do adjust to resource imbalances but the adjustments may take time, and perhaps considerable time. In the analysis of Chapter 7 we allowed for this by assuming fixity in the short run and adaptability in the long run; we merged the two models of production, in effect, and investigated the implications of alternative rates of adjustment in a series of computer simulation experiments. It is our impression that much discussion of manpower policy implicitly adopts the fixed-coefficient view

of the world. Technology is sometimes seen as an onrushing force which inevitably leaves behind it a trail of unemployment and redundancy unless the changes in methods of production can be foreseen in time and new training programs put in place. We have argued that this is an inappropriate view. The economy is an adaptive organism, and it will tend of itself to adapt to changing circumstances, without government action. In some of the experiments of Chapter 7, we assumed that skilled labour was initially in short supply, and acting as a bottleneck which prevented the full employment of unskilled labour and capital stock. We then introduced an expanded training program in some experiments but not in others. The economy tended to absorb the unused resources in all cases, but the speed of absorption and the associated rate of increase of total output were greater when there was expanded training activity. The point is that a training program may facilitate and speed up the natural adjustment processes but that the notion that the adjustments would not take place without the program is ill-founded. This leads to the conclusion that manpower planning should involve an appreciation of natural adjustment processes and should concern itself with complementing and facilitating them, not substituting for them.

Changing the overall skill composition of the labour force is a very slow process, as the simulation experiments clearly demonstrated. A 40 percent expansion of training activity took almost five decades to reach its goal of raising the skill proportion from 25 percent of the labour force to 35 percent, and many years even to approach that goal. The rate at which the skill proportion can be altered is to some extent related to the age distribution of the population, which in turn is largely a function of the fertility rates of earlier decades. A

population with high fertility levels grows more rapidly and has an age distribution that is tilted towards the younger end. Given that young people are generally more amenable to training and the redirection of careers, it should be possible to affect the average skill level more rapidly in such a population. This is indeed true, as some of the simulation experiments indicate. But the effects are small. Comparisons of experiments in which the population is growing rapidly with others in which it is declining rapidly reveal little difference. Demographic influences thus seem to be of only minor importance. This finding is of practical significance, inasmuch as both the Canadian and Ontario populations have shifted from very high to very low fertility levels in the past two decades.

The skill composition of the labour force can be altered either by training or by immigration with high skill content. Slow as it is, the training instrument is more rapid than the immigration instrument, under reasonable assumptions. In experiments in which annual immigration was increased from 0 to 0.5 percent of the population per annum, and immigrant labour had twice the skill content of domestic labour, the overall skill proportion increased only from 25 to 27.5 percent of the labour force after half a century. A rate of 0.5 percent is a high rate for Canada, by historical standards, and to maintain it indefinitely is not a realistic possibility. Immigration may have a limited role in manpower policy, but training must be the major instrument if the objective is to alter the skill level of the labour force in any substantial degree.

The use of immigration as an instrument assumes that it is controllable. The federal government may be able to exercise a considerable degree of control over admissions to Canada but it has virtually

no control over emigration. Moreover, a provincial government typically
has little control over any type of population movement, whether to
or from other countries or to or from other provinces.[3]

There is another important consideration. Training alters the
depth of human capital, so to speak, and leaves the size of the population ·
unaffected. But immigration adds to the population at the same time
that it augments the labour force. Thus, while immigration may increase
total output and total income in the economy, it is by no means certain
that it will raise the per capita levels, and these are of much more
relevance. Indeed, in the simulation experiments there was a widespread
tendency for the per capita output level to fall when immigration was
introduced, in consequence of the fact that the supply of labour was
increased without any corresponding increase in the stock of capital. An
argument one sometimes hears is that there are increasing returns to scale
in the Canadian economy, and that immigration will help to realize them by
generating a larger population. However, in an experiment in which in-
creasing returns were allowed for, immigration again caused output to be
lower for many decades than it would otherwise have been. A whole century
of sustained immigration at 0.5 percent of the population per annum was
required before per capita output was raised by as much as 2.5 percent.
The returns-to-scale argument in support of immigration is quite unconvincing.[4]

Manpower programs do not merely affect the economic aggregates;
they have distributional effects as well. A new or expanded training
program implies additional current expenditure, presumably in the
expectation of future benefits. Questions then arise as to who will
pay the costs and who will receive the benefits. The additional
expenditure has implications for the government budget: taxes must be

raised, other expenditures curtailed, or deficit financing resorted to.
Whatever the method of financing, the burden of the costs must fall
somewhere, and the segment of the economy that bears the costs is not
necessarily the one that reaps the benefits. As with any form of
government expenditure, the effects spread throughout the economy, in
principle affecting private incomes, consumption, saving, and investment.
Discussions of manpower policy seem prone to ignore these macroeconomic
effects and to assume implicitly that only the labour market need be
considered. But the effects are there nevertheless. One might wish
that future discussions of manpower policy would take a broader view
and recognize more clearly the links between the labour market and the
rest of the economy. One might wish also that they would take a longer
view, and recognize that actions taken today to affect the stock of labour
have implications for the economy extending far into the future.

FOOTNOTES TO CHAPTER 8

1. An incidental further benefit would be the possibility of much better information about what training actually takes place. Companies would have to report on their training expenditures in order to get credit for them and avoid having to pay the levy. Moreover, they would have a strong incentive to report all such expenditures.

2. See, for example, Meltz (1981), Newton, Betcherman, and Meltz (1981), and Denton (1981).

3. The fact that provincial governments have little control over population movements may reduce their incentive to mount their own training programs, inasmuch as they may not wish to pay for the creation of human capital which then would be free to move elsewhere. Presumably, the smaller the province, the less would be the incentive. There is an analogy here with the distinction between general and specific training in the case of a firm. In a sense, training within a small area is "general" because there are many other areas in which the skills can be used, whereas training within a large area is more "specific" since the opportunities for moving to other areas are fewer.

4. For further discussion of the economic effects of immigration in the Canadian context, see Denton and Spencer (1978) and studies cited therein.

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